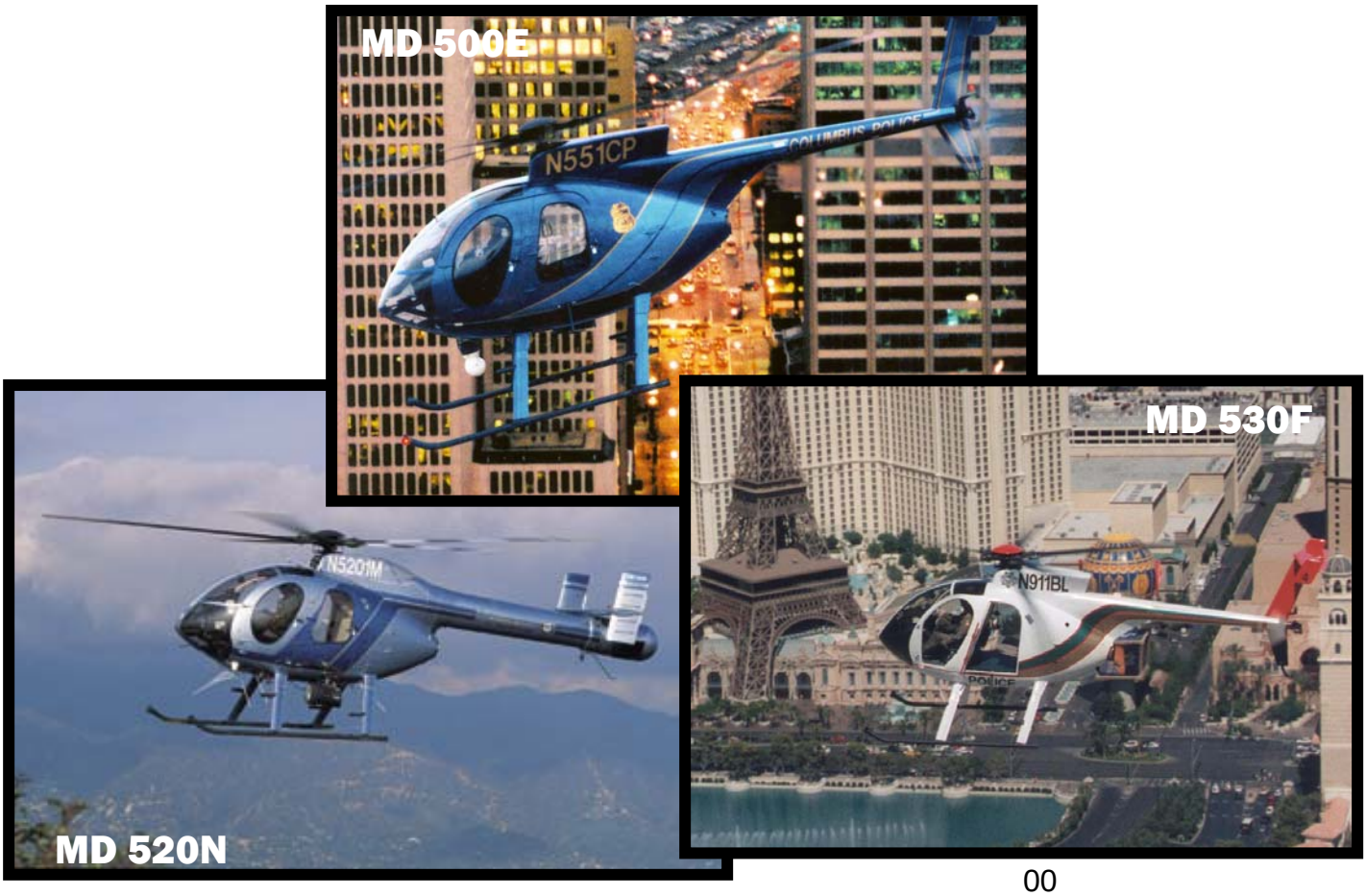
500 SERIES

TECHNICAL DESCRIPTION



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Revised January 2011

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This Technical Description is not subject to a revision service. It is the manufacturer's practice to continuously improve its products and therefore the right is reserved to make changes without notice in the design or manufacture of the MD 500 Series helicopters which may be considered necessary.

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MD 500E

FEATURES AND BENEFITS

1.0 MD500E® Features and Benefits

The MD 500E® delivers the highest speed, payload and productivity in its class. Rear seat passengers have greater headroom and visibility than earlier Model 500s. Refinements provide first class front and rear seating with ample legroom. The T-shaped instrument panel provides space for a full complement of modern avionics.

With a five-bladed main rotor and the choice of a 420-shp Rolls-Royce 250-C20B or 450-shp Rolls-Royce 250-C20R turbine engine, the MD 500E® is the best performing helicopter in its class. The MD 500E® light turbine helicopter allows easy configuration conversions from a deluxe, five-place executive transport to a utility cargo carrier. Typical uses include urban and remote location transportation of key personnel, technicians and craftsmen; aerial survey, patrol and photography; agricultural and fire-fighting applications; air rescue operations; and numerous other tasks within the construction, petroleum and forestry industries.

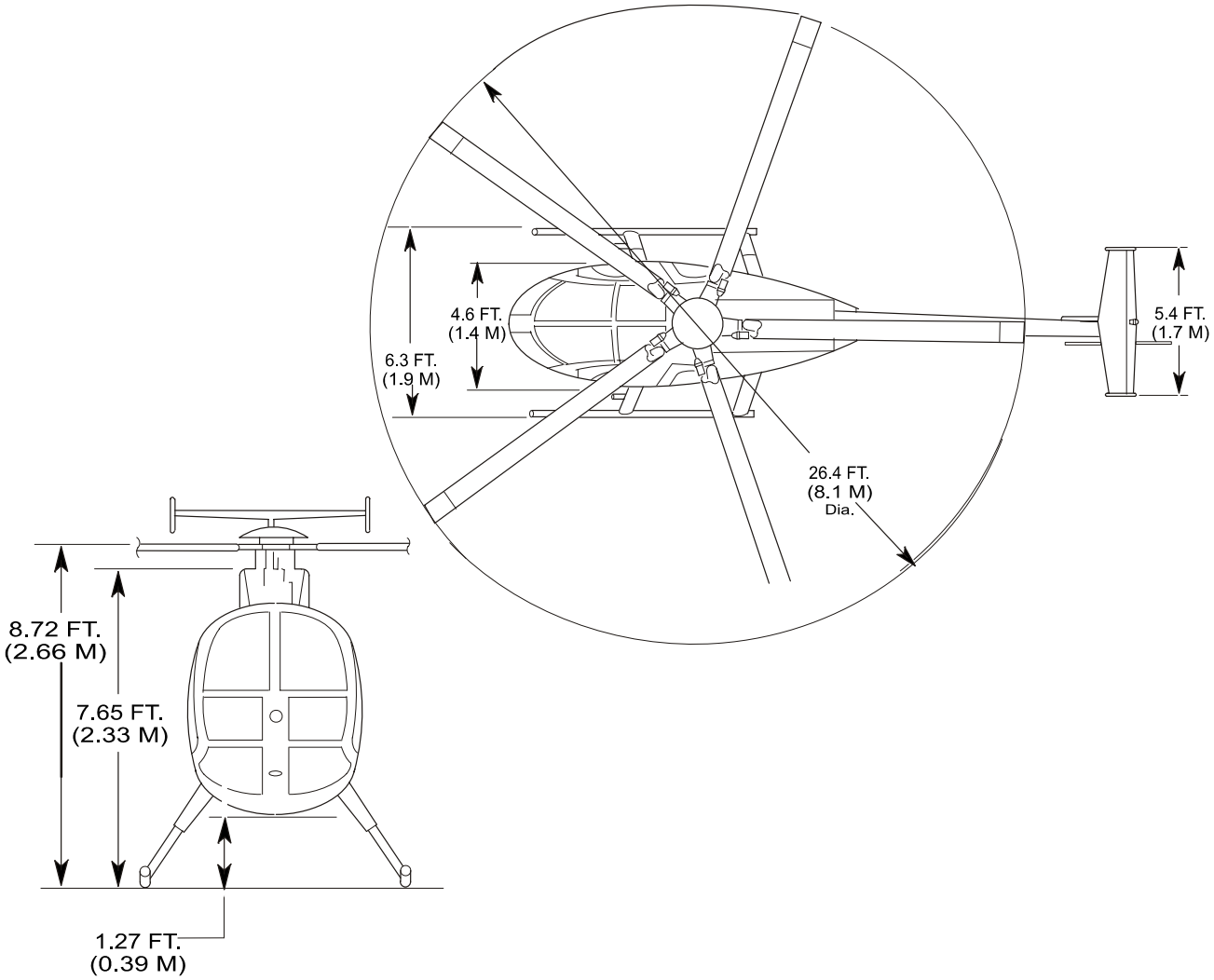
Standard high-clearance skids permit operations in rough terrain, while other optional equipment, such as inflatable floats and litter kit increase the versatility of the MD 500E®.

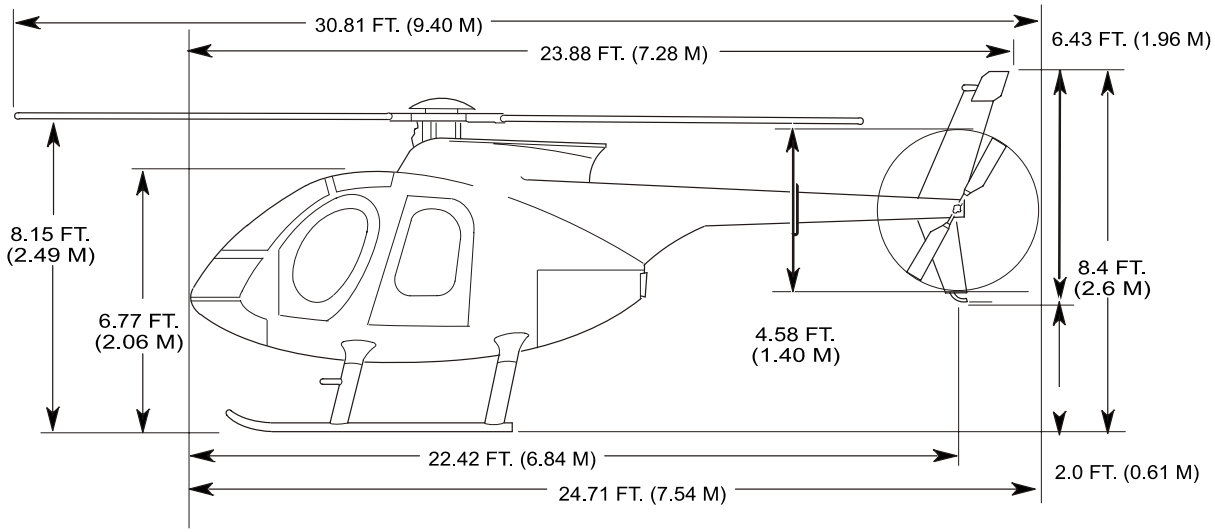
Proven reliability of the de-rated turbine engine, fail-safe design and a worldwide network of factory-authorized service centers assure customer satisfaction.

- STANDARD COCKPIT INTERIOR

- STANDARD CABIN INTERIOR

1.1 Dimensions





2.0 MD 500E® Standard Equipment

Airframe

- Extended Landing Gear
- Rapid Door Removal Hinges (cockpit and cabin)
- Tinted Canopy Panels
- Tinted Door/window panel-left front
- Tinted Door/window panel-left rear
- Tinted Door/window panel-right front
- Tinted Door/window panel-right rear
- Rain Gutter Set
- Keyed Locks (4)
- Fuselage Hard Points
- Jacking Fittings
- Passenger Steps
- Anti-collision Lights (2)
- Landing Light, nose mounted
- Position Lights

Interior

- LH Rotor Brake
- Heater Defogger System
- Crew Seats with 4-point Harness Restraint
- Passenger Seats with 3-point Harness Restraint
- Vinyl and Fabric Cushions
- Vinyl Interior Trim Panels
- Crew and Cabin Compartment Floor Carpet
- Map Case
- Fire Extinguisher
- First-Aid Kit
- Cabin 28-volt Utility Outlet
- Battery-Heavy Duty Marathon 17-ampere-hour
- Fresh Air Ventilation System
- Cockpit Utility Light
- Cabin Convenience Light
- Instrument Lighting
- Cabin Soundproofing
- Cargo Tie-Down Fittings

Rotor and Controls

- Dual LH Command Flight Controls

MD 500E

STANDARD EQUIPMENT

Engine and Electrical

- Rolls-Royce 250-C20B Engine, 420 shp (313 kw)
- Automatic Engine Reignition
- Engine Wash Kit, MD 500 series
- 64 Gallon (242 l) Fuel System
- 85 amp Starter Generator
- External Power Receptacle
- Engine anti-ice

Flight and Engine Instruments

- AFS Engine Inlet Barrier Filter
- Facet Oil Filter
- Dual tachometer, NR and N2
- Engine oil pressure indicator
- Engine torque meter
- N1 tachometer
- Fuel quantity indicator
- Digital chronometer
- Airspeed indicator
- Barometric altimeter
- DC ammeter
- Outside air temperature indicator
- Magnetic compass
- Turbine outlet temp indicator
- Engine oil temp indicator

Annuciator Panel

- Battery Overtemp Warning Light
- Engine Chip Detector Warning Light
- Engine Out Warning Light
- Fuel Filter Obstruction Warning Light
- Fuel Low Warning Light
- Generator Out Warning Light
- Low Rotor rpm Warning Light
- Main Transmission Chip Detector Warning Light
- Main Transmission Oil Pressure Warning Light
- Main Transmission Oil Temp Warning Light
- Tail Rotor Transmission Chip Detector Warning Light

Miscellaneous

- Engine and Airframe Log Books
- Engine Maintenance Manual
- Battery Logbook
- Flight Manual
- Handbook of Maintenance Instructions
- Illustrated Parts Catalog
- Engine Exhaust Cover
- Engine Inlet Cover
- Pitot Tube Cover
- Fan Inlet Cover
- Main Rotor Blade Tie-Downs
- Ground Handling Wheels
- One color paint

3.0 MD500E® PERFORMANCE SPECIFICATIONS

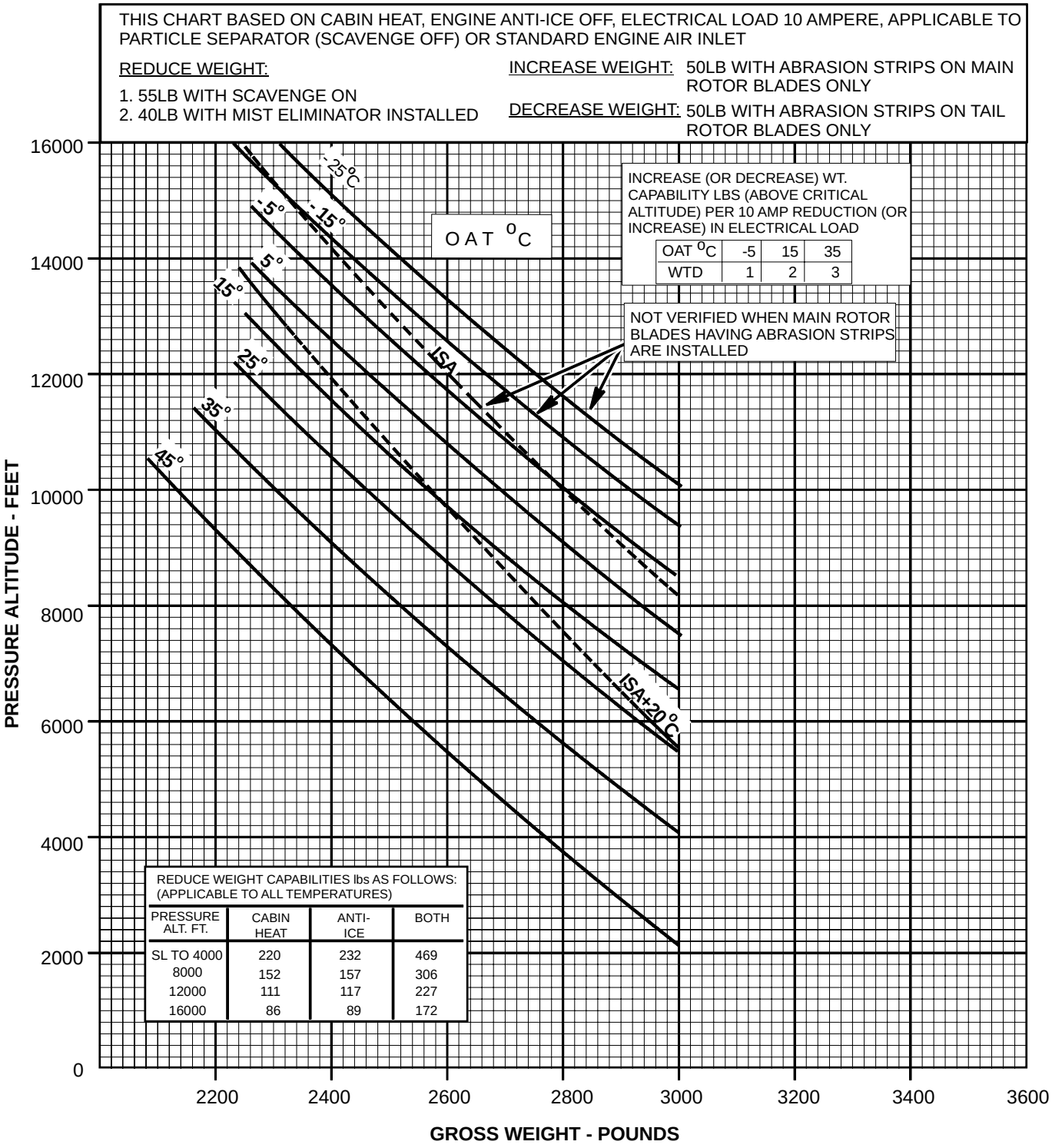
3.1 Performance Specifications (C20B Engine)

Performance With C20B Engine			
Characteristics at Design Gross Weight		Metric 1361 KG	Imperial 3000 lb.
Maximum Cruise Speed	Sea level 1524 m (5,000 ft)	249 km/hr 246 km/hr	135 kt (155 mph) 133 kt (153 mph)
Speed for Best Range	1524 m (5,000 ft)	222 km/hr	120 kt (138 mph)
Maximum Permitted Speed	VNE at sea level	282 km/hr	152 kt (175 mph)
Maximum Range	Sea level 1524 m (5,000 ft)	478 km 537 km	258 nm (297 mi) 290 nm (304 mi)
Maximum Endurance	Sea level	2.8 hr	2.8 hr
Maximum Rate of Climb:(TOP)	Sea level, Standard day ISA +20° C day	9.0 m/sec 9.0 m/sec	1,770 fpm 1,776 fpm
Maximum Operating Altitude	Density Altitude	4877 m	16,000 ft
Service Ceiling	ISA	4227 m	13,900 ft
Maximum Hook Capacity		907 kg	2,000 lb
Hovering Performance In-ground effect Out-of-ground effect:	Standard day ISA + 20° C day Standard day ISA + 20° C day	2591 m 1829 m 1829 m 945 m	8,500 ft 6,000 ft 6,800 ft 3,100 ft
WEIGHTS			
Characteristics		Metric	Imperial
Maximum Gross Weight	Normal category	1361 kg	3,000 lb
External load operations		1610 kg	3,550 lb
Empty Weight	Standard configuration	672 kg	1,481 lb
Useful Load	Normal category	689 kg	1,519 lb
External load operations		938 kg	2,069 lb
Usable Fuel Capacity	242 L (64 gal	183 kg	403 lb
POWER PLANT			
Characteristics		Metric	Imperial
Rolls-Royce Model 250-C20B gas turbine	Rated power:	313 kw	420 shp
Derated for reliability and safety to	Takeoff power Max continuous power	280 kw 261 kw	375 shp 350 shp

3.2 Performance Specifications (C20R Engine)

Performance with C20R Engine			
Characteristics at Design Gross Weight		Metric 1361 KG	Imperial 3000 lb.
Maximum Cruise Speed	Sea level 1524 m (5,000 ft)	249 km/hr 251 km/hr	135 kt (155 mph) 136 kt (156 mph)
Speed for Best Range	1524 m (5,000 ft)	222 km/hr	120 kt (138 mph)
Maximum Permitted Speed	VNE at sea level	282 km/hr	152 kt (175 mph)
Maximum Range	Sea level 1524 m (5,000 ft)	472 km 532 km	255 nm (293 mi) 287 nm (297 mi)
Maximum Endurance	Sea level	2.7 hr	2.7 hr
Maximum Rate of Climb:(TOP)	Sea level, Standard day ISA +20° C day	9.0 m/sec 9.0 m/sec	1,770 fpm 1,776 fpm
Maximum Operating Altitude	Density Altitude	4877 m	16,000 ft
Service Ceiling	ISA	5029 m	16,500 ft
Maximum Hook Capacity		907 kg	2,000 lb
Hovering Performance In-ground effect Out-of-ground effect:	Standard day ISA + 20° C day Standard day ISA + 20° C day	3444 m 2103 m 2652 m 1250 m	11,300 ft 6,900 ft 9,500 ft 4,100 ft
WEIGHTS			
Characteristics		Metric	Imperial
Maximum Gross Weight	Normal category External load operations	1361 kg 1610 kg	3,000 lb 3,550 lb
Empty Weight	Standard configuration	686 kg	1,517 lb
Useful Load	Normal category External load operations	673 kg 922 kg	1,483 lb 2.033 lb
Usable Fuel Capacity	242 L (64 gal)	183 kg	403 lb
POWER PLANT			
Characteristics		Metric	Imperial
Rolls-Royce Model 250-C20B gas turbine, Rated power		336 kw	450 shp
De-rated for reliability and safety to	Takeoff power: Max. continuous power	280 kw 261 kw	375 shp 350 shp

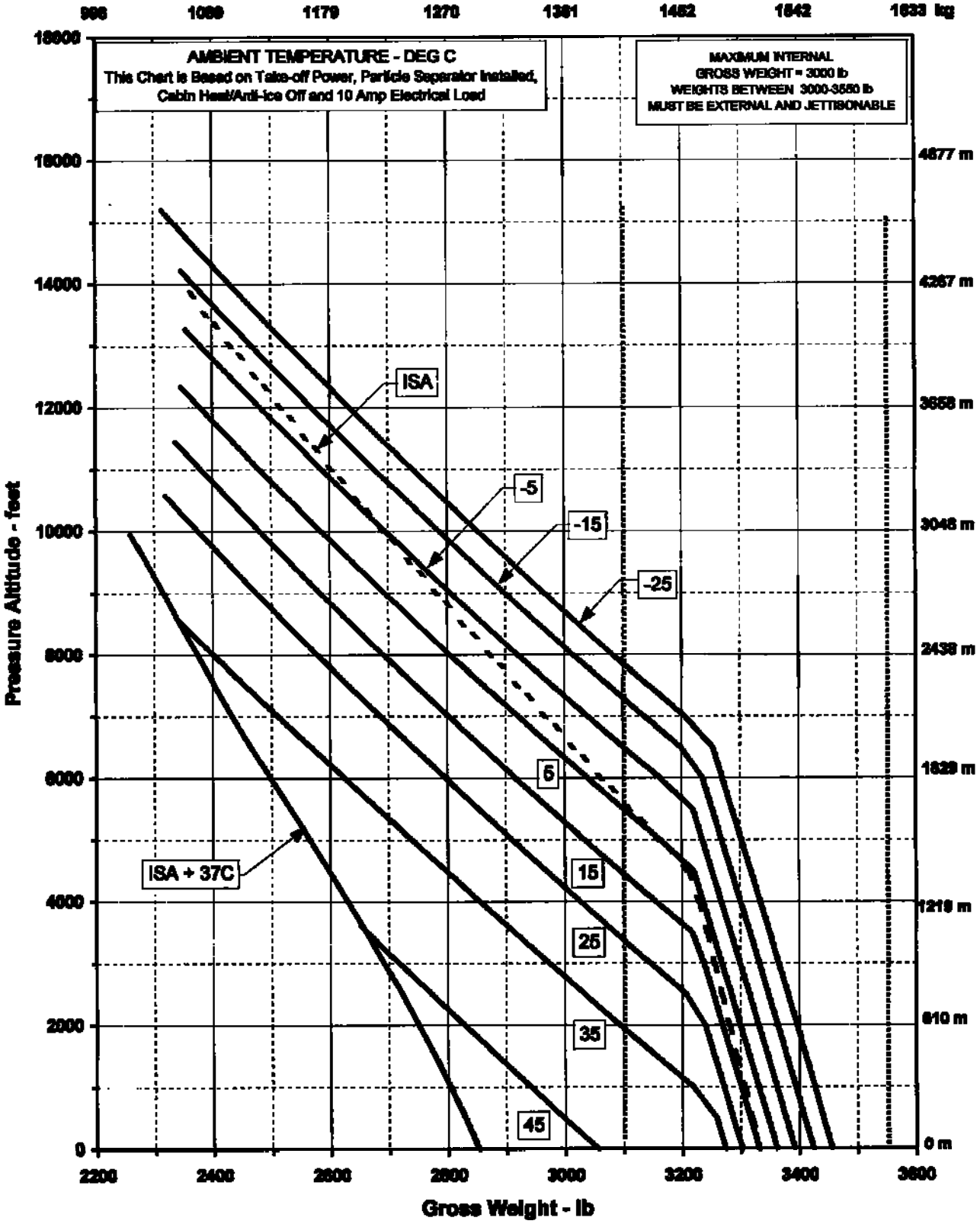
3.3 Hover-In-Ground-Effect (C20B Engine)


THIS CHART BASED ON CABIN HEAT, ENGINE ANTI-ICE OFF, ELECTRICAL LOAD 10 AMPERE, APPLICABLE TO PARTICLE SEPARATOR (SCAVENGE OFF) OR STANDARD ENGINE AIR INLET
REDUCE WEIGHT:
1. 55LB WITH SCAVENGE ON
2. 40LB WITH MIST ELIMINATOR INSTALLED
INCREASE WEIGHT: 50LB WITH ABRASION STRIPS ON MAIN ROTOR BLADES ONLY
DECREASE WEIGHT: 50LB WITH ABRASION STRIPS ON TAIL ROTOR BLADES ONLY
INCREASE (OR DECREASE) WT. CAPABILITY LBS (ABOVE CRITICAL ALTITUDE) PER 10 AMP REDUCTION (OR INCREASE) IN ELECTRICAL LOAD
OAT °C | -5 | 15 | 35
WTD | 1 | 2 | 3
NOT VERIFIED WHEN MAIN ROTOR BLADES HAVING ABRASION STRIPS ARE INSTALLED
OAT °C
-25°C
-15°
-5°
5°
15°
25°
35°
45°
ISA
ISA+20°C
REDUCE WEIGHT CAPABILITIES lbs AS FOLLOWS: (APPLICABLE TO ALL TEMPERATURES)
PRESSURE ALT. FT. | CABIN HEAT | ANTI-ICE | BOTH
SL TO 4000 | 220 | 232 | 469
8000 | 152 | 157 | 306
12000 | 111 | 117 | 227
16000 | 86 | 89 | 172
PRESSURE ALTITUDE - FEET
0
2000
4000
6000
8000
10000
12000
14000
16000
2200
2400
2600
2800
3000
3200
3400
3600
GROSS WEIGHT - POUNDS

<<<< ROLLS ROYCE 250-C20B >>>>

F03-036-1

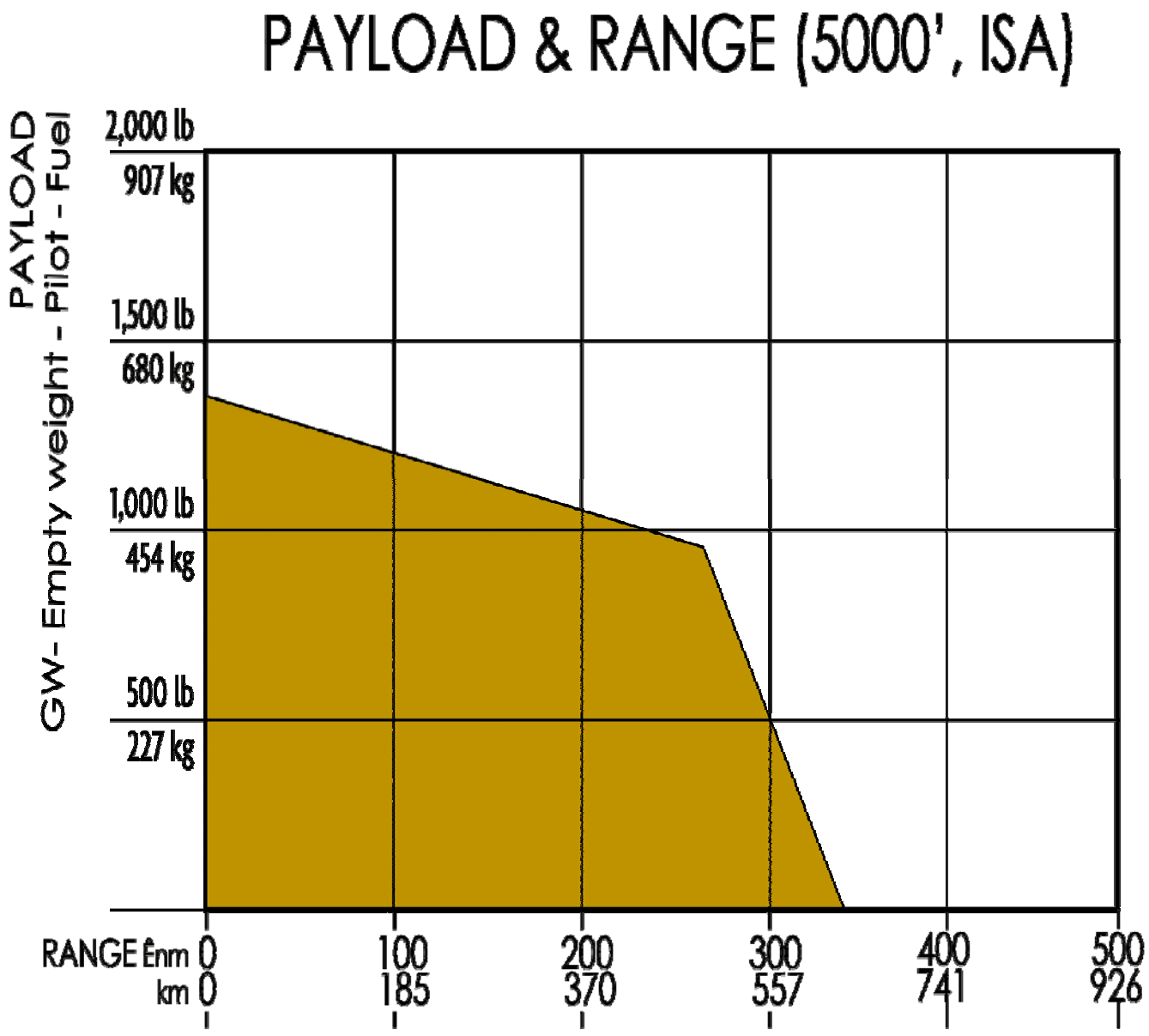
3.4 Hover-Out-of-Ground-Effect (C20B Engine),



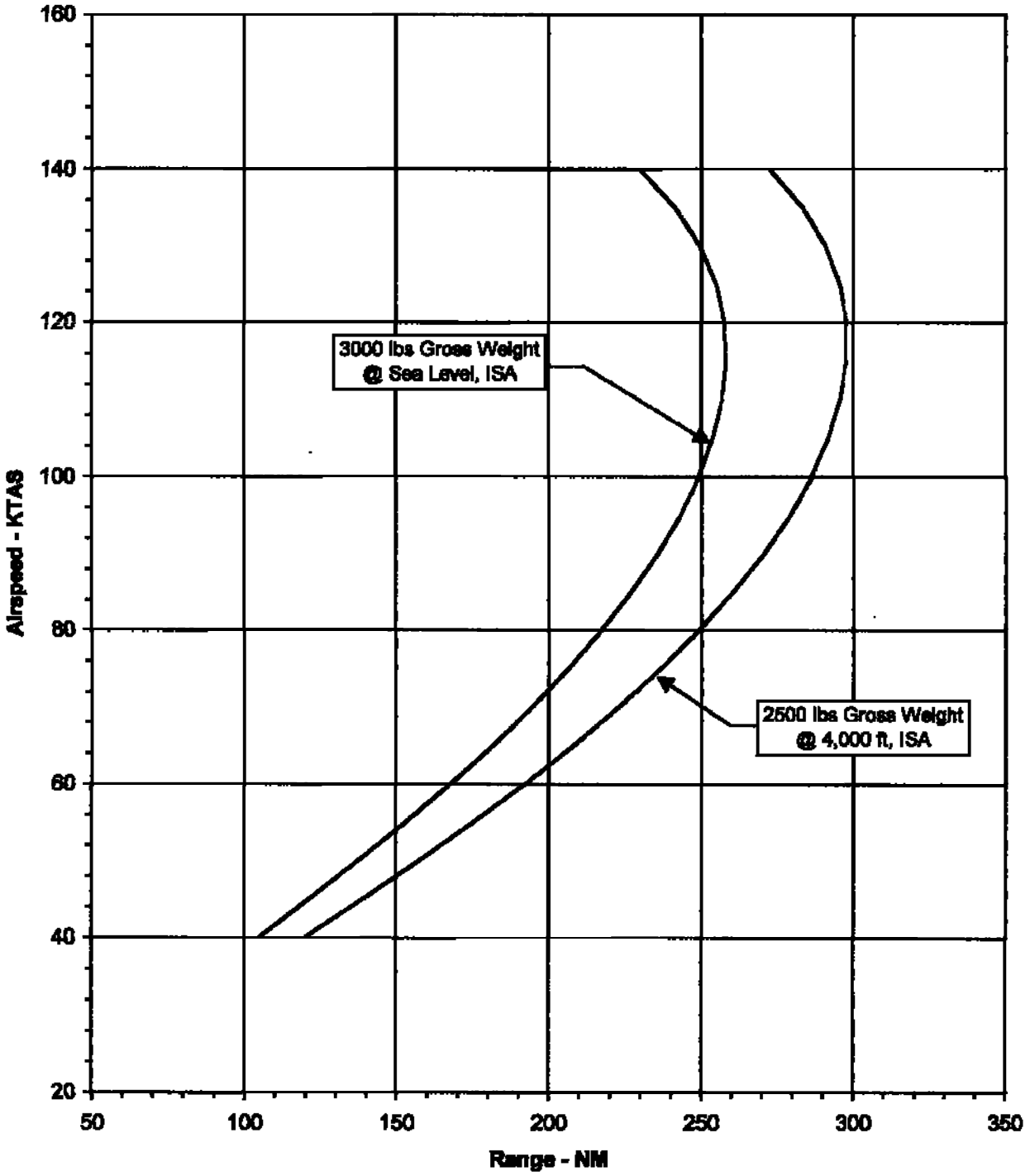
3.5 Takeoff Gross Weight Worksheet (C20B Engine)

	C20B	Mission #1	Mission #2
Empty Weight	1,481 lb (672 kg)		
Pilot	170 lb (77 kg)		
Fuel	403 lb (183 kg)		
Payload	946 lb (428 kg)		
Takeoff GW	3,000 lb (1361 kg)		

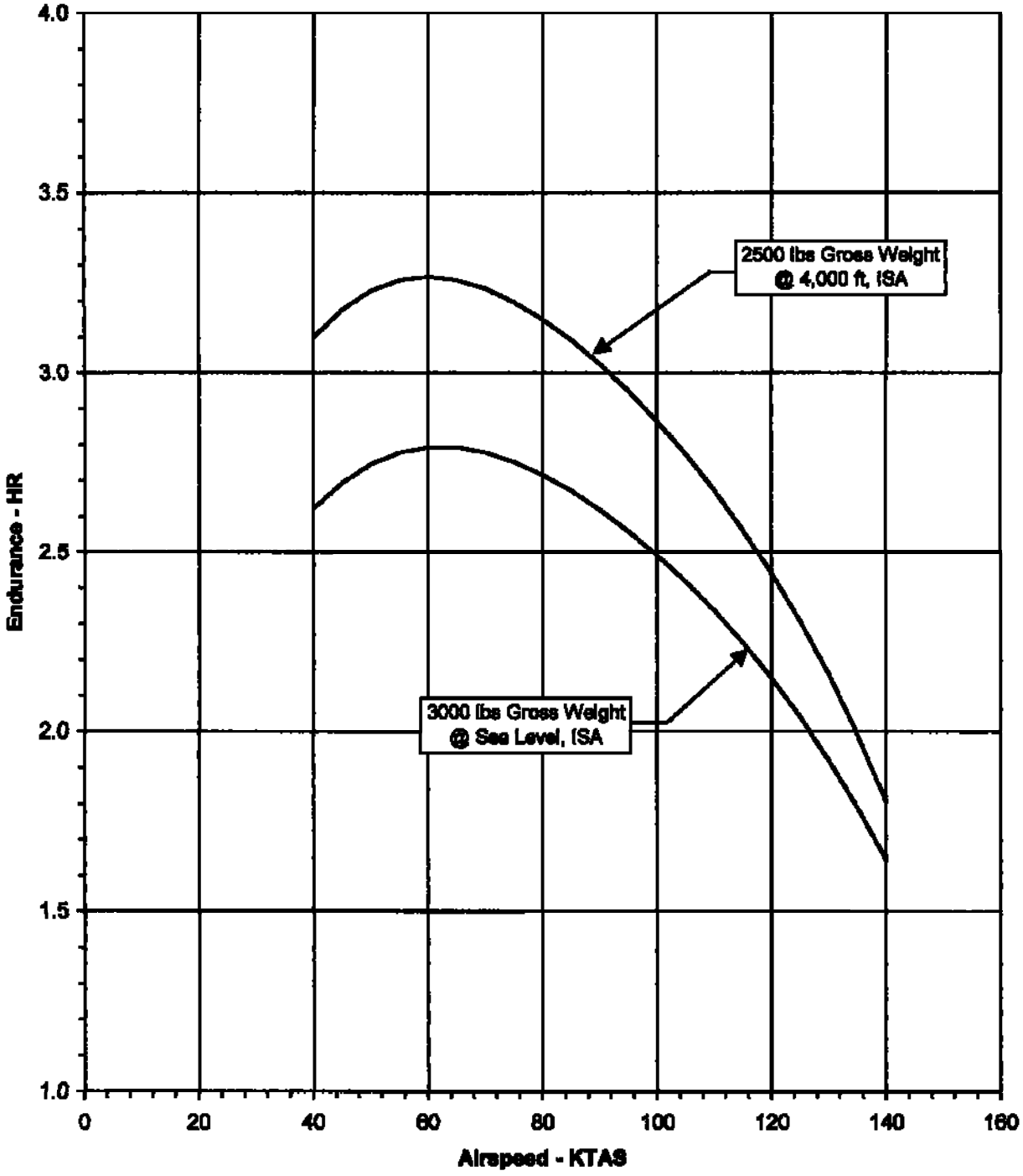
3.6 Payload vs Range (5000', ISA) (C20B Engine)



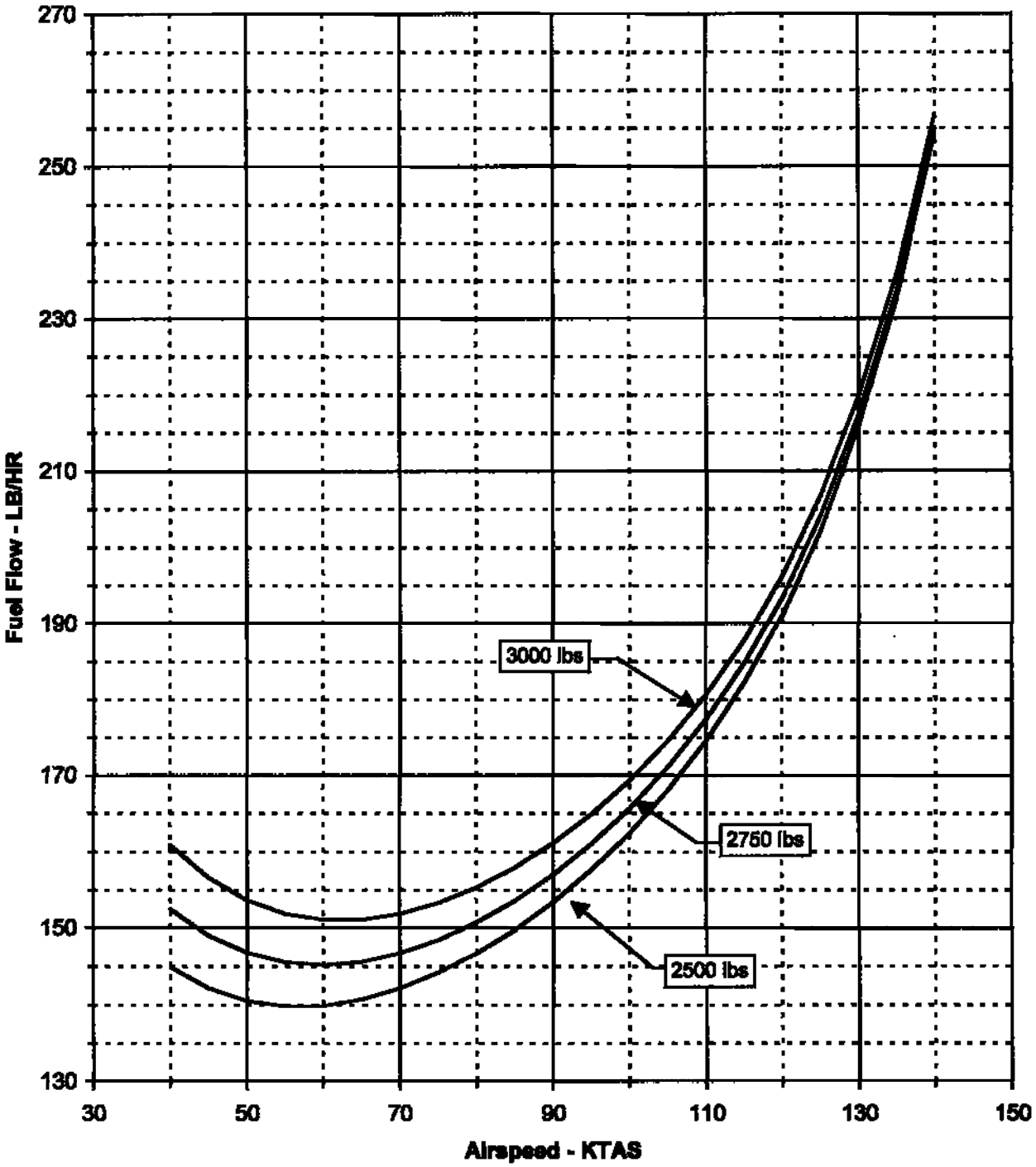
3.7 Speed for Best Range (C20B Engine)



3.8 Speed for Best Endurance (C20B Engine)

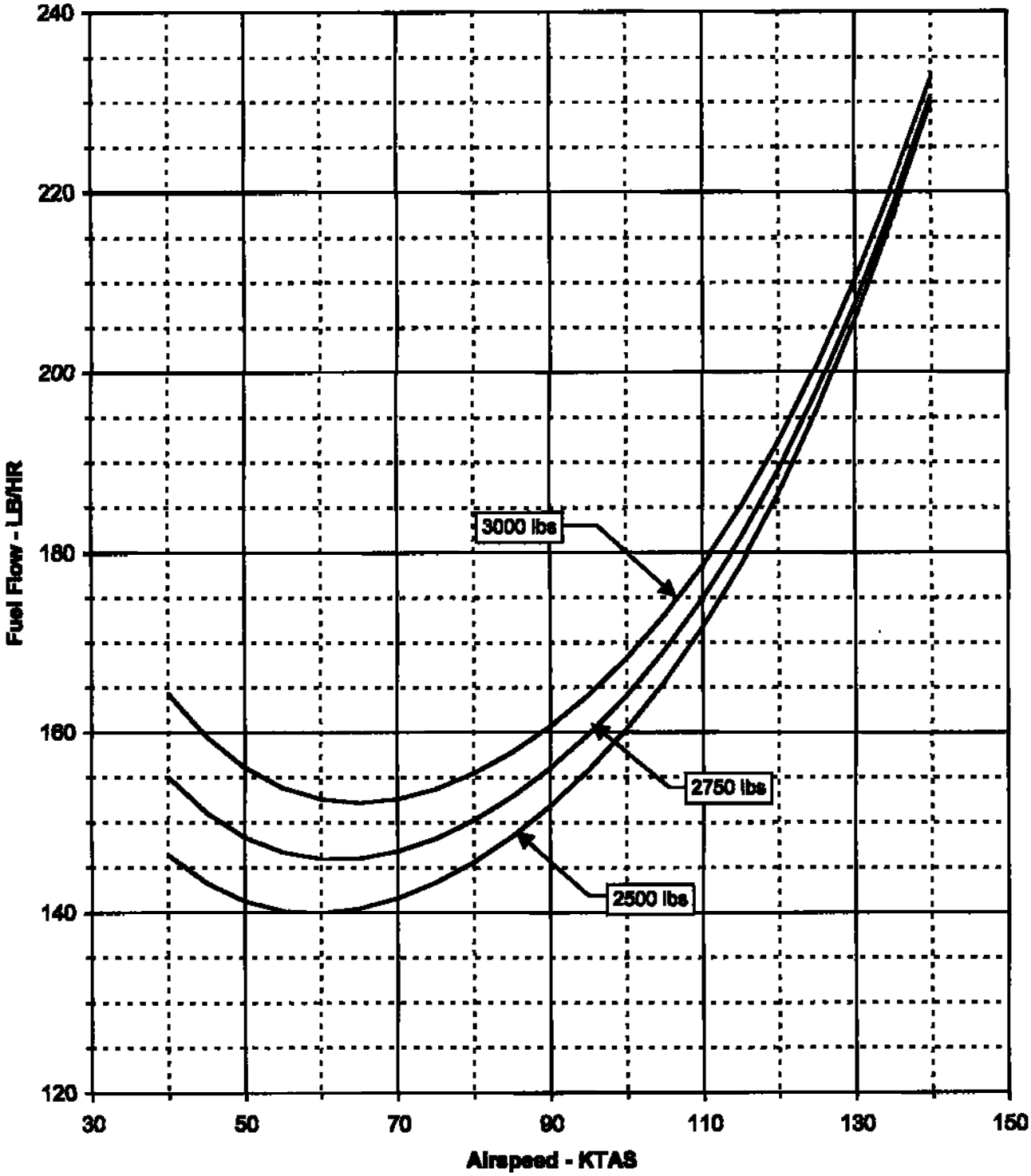


3.9 Fuel Flow, Sea Level, ISA (15°C) (C20B Engine)



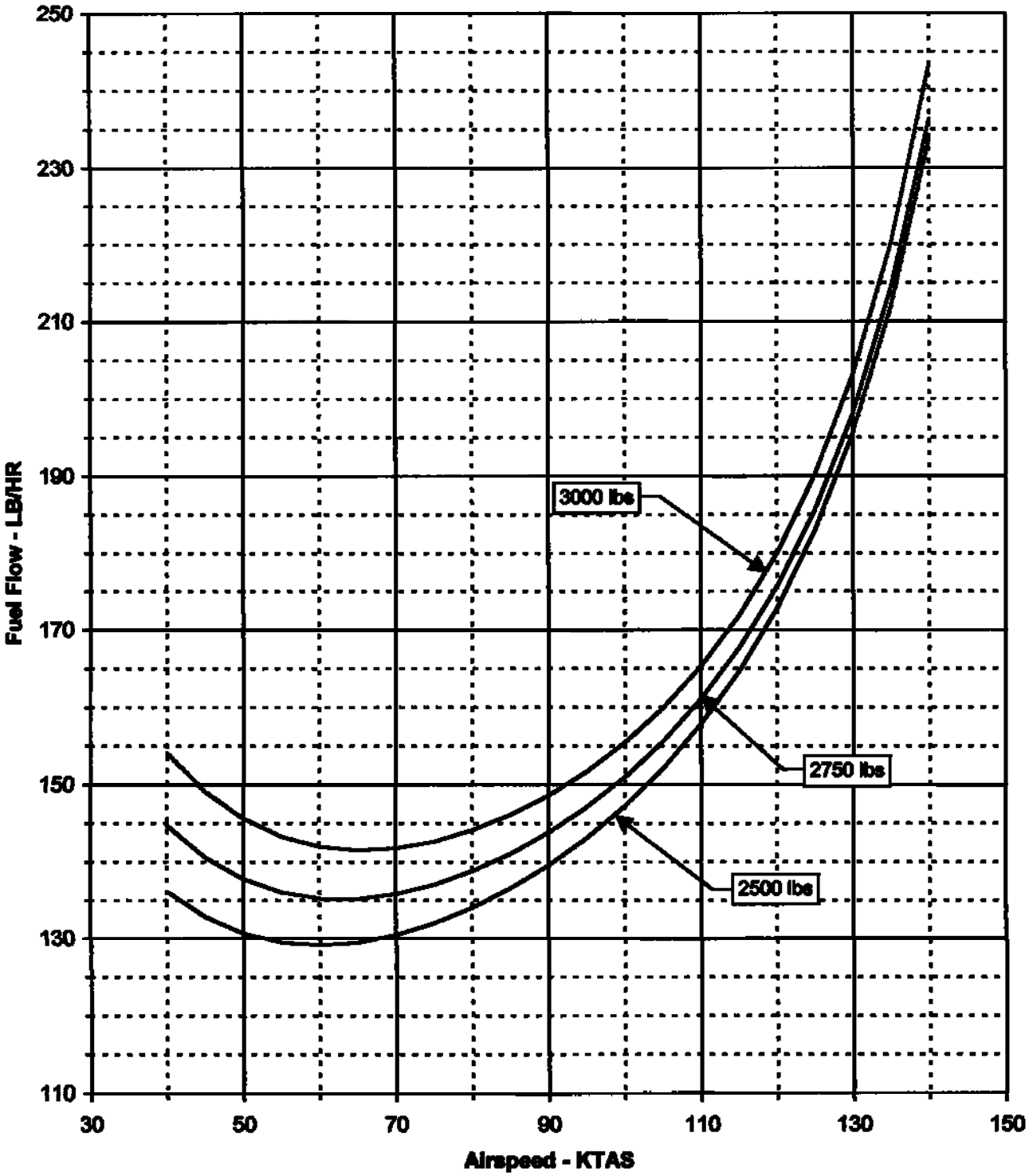
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

3.10 Fuel Flow, Sea Level, ISA +20°C (35°C) (C20B Engine)



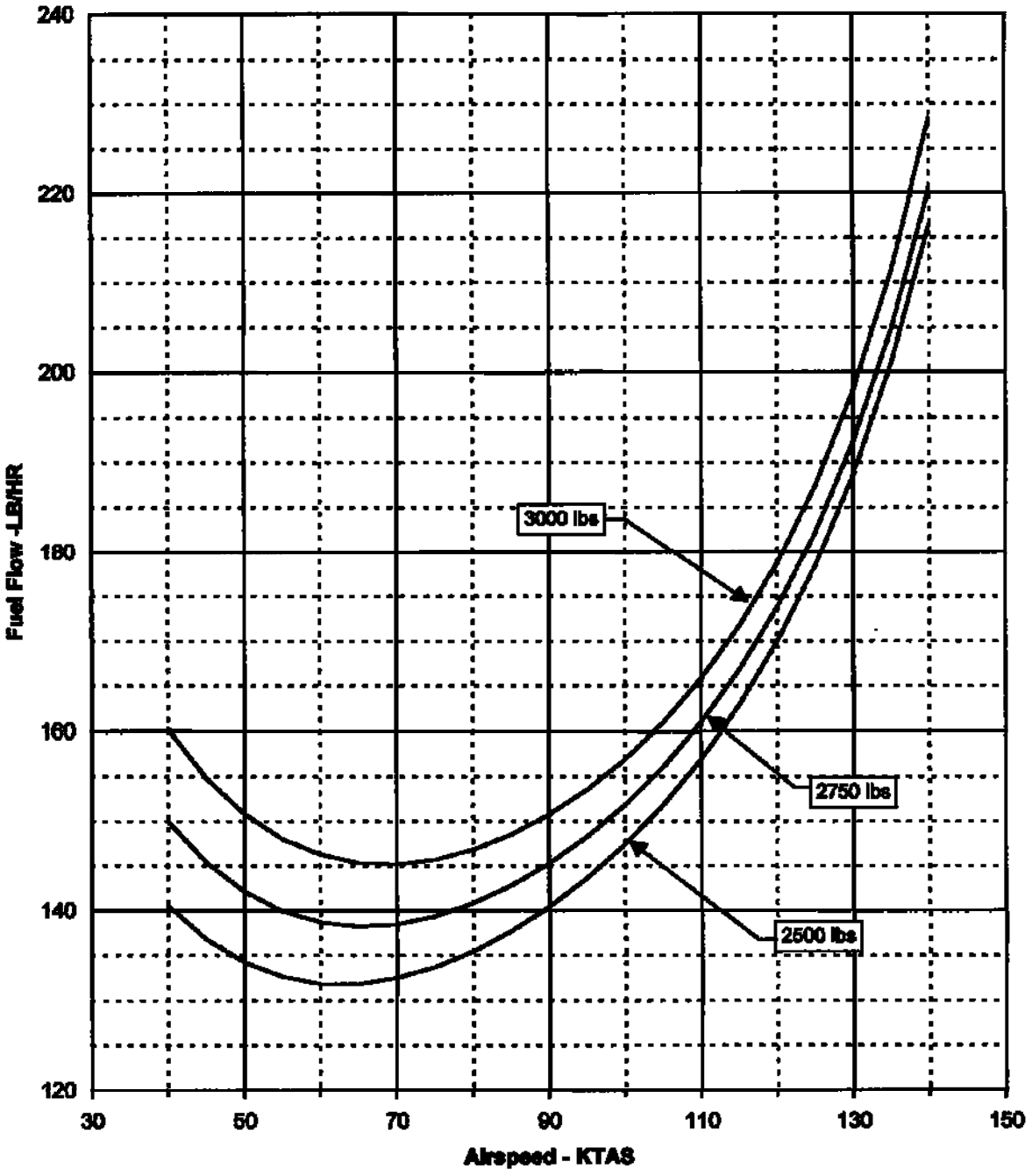
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

3.11 Fuel Flow, 4,000 feet, ISA (7°C) (C20B Engine)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

3.12 Fuel Flow, 4,000 feet, ISA +20°C (27°C) (C20B Engine)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

3.13 Hover-In-Ground-Effect (C20R Engine)

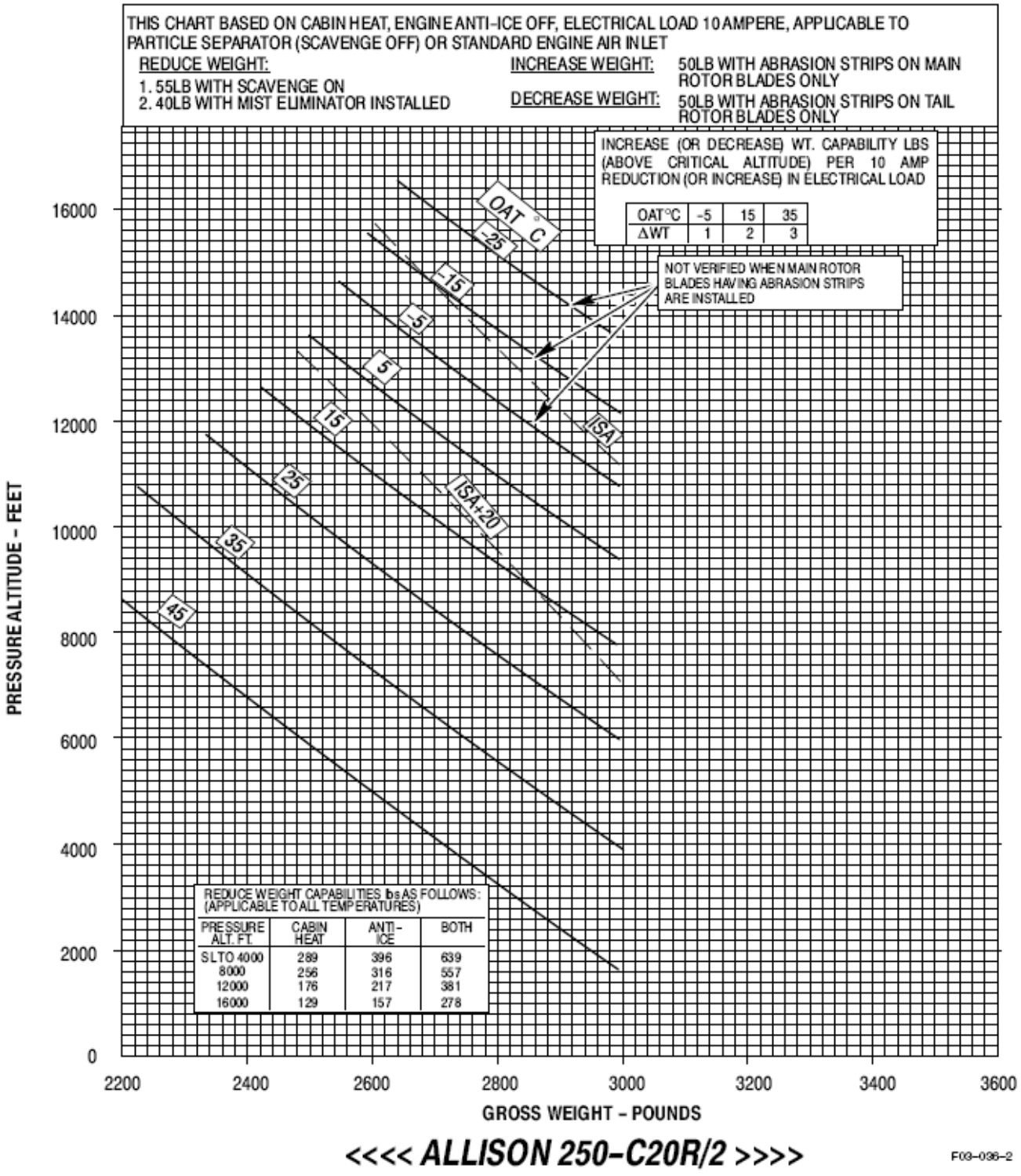
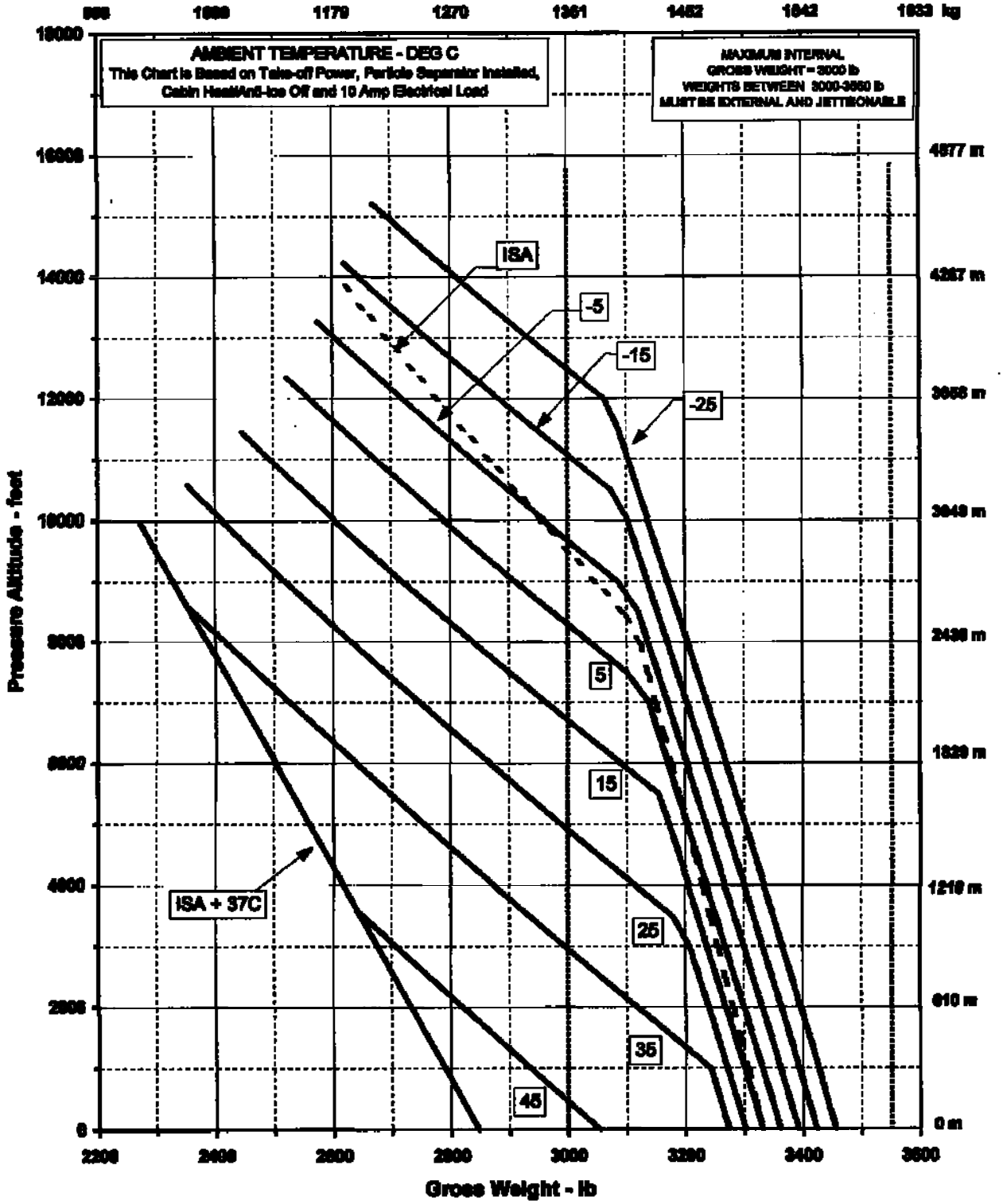


Figure 5–11. Hover Ceiling VS Gross Weight, IGE, 3.5 Foot Skid Clearance, Extended Landing Gear, Allison 250–C20R/2

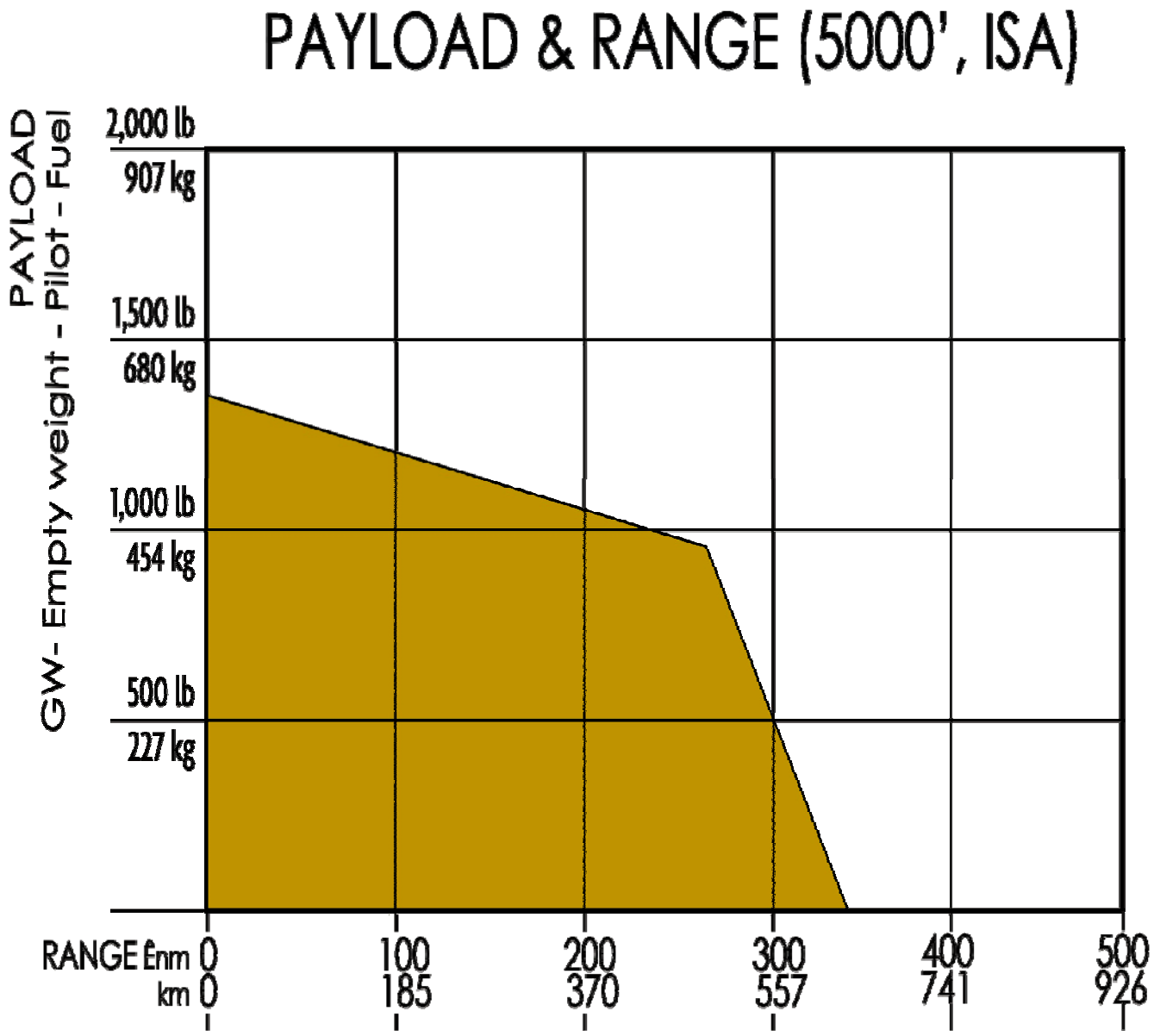
3.14 Hover-Out of-Ground-Effect (C20R Engine)



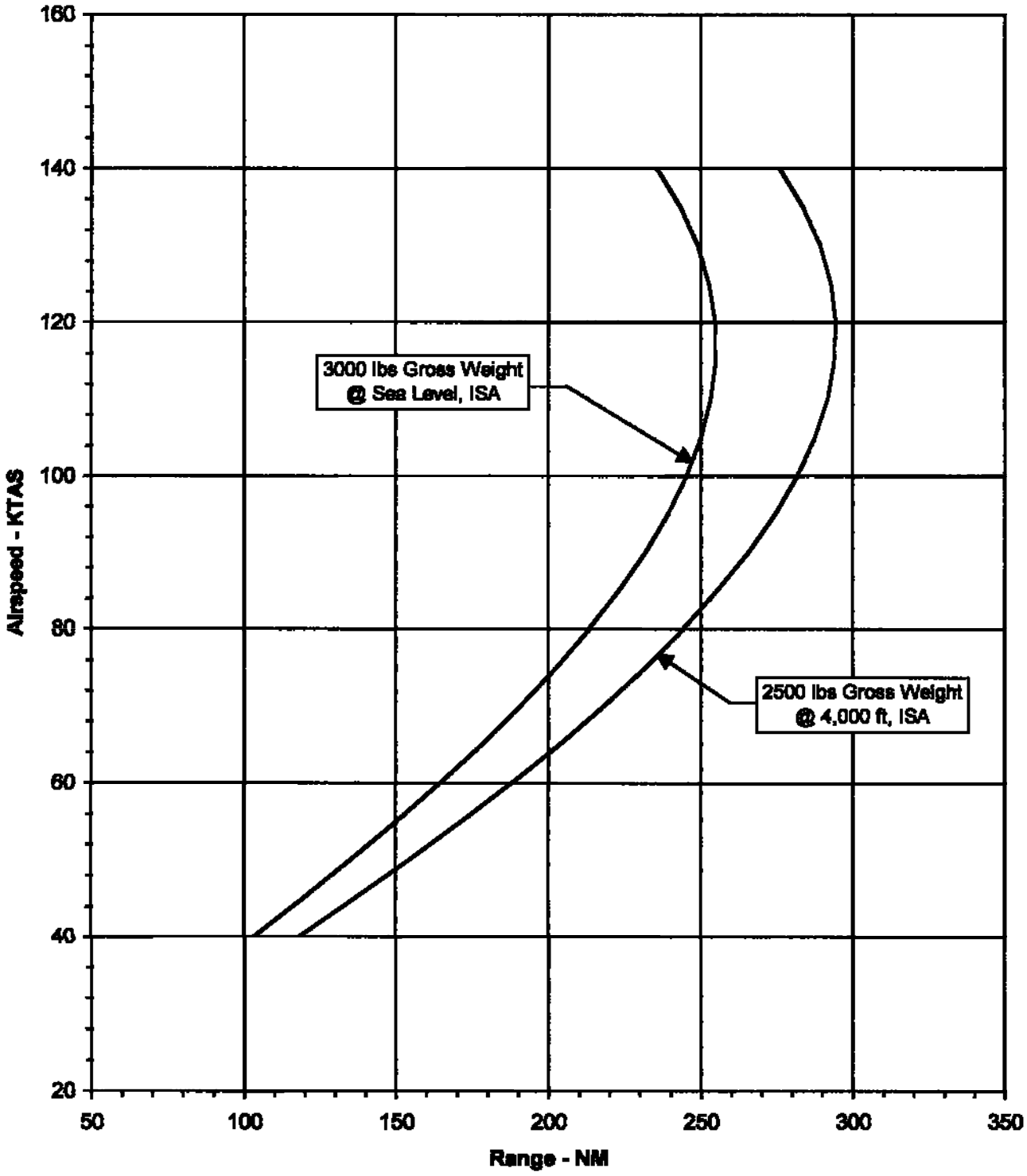
3.15 Takeoff Gross Weight Worksheet (C20R Engine)

	C20R	Mission #1	Mission #2
Empty Weight	1,517 lb (688 kg)		
Pilot	170 lb (77 kg)		
Fuel	403 lb (183 kg)		
Payload	910 lb (413 kg)		
Takeoff GW	3,000 lb (1361 kg)		

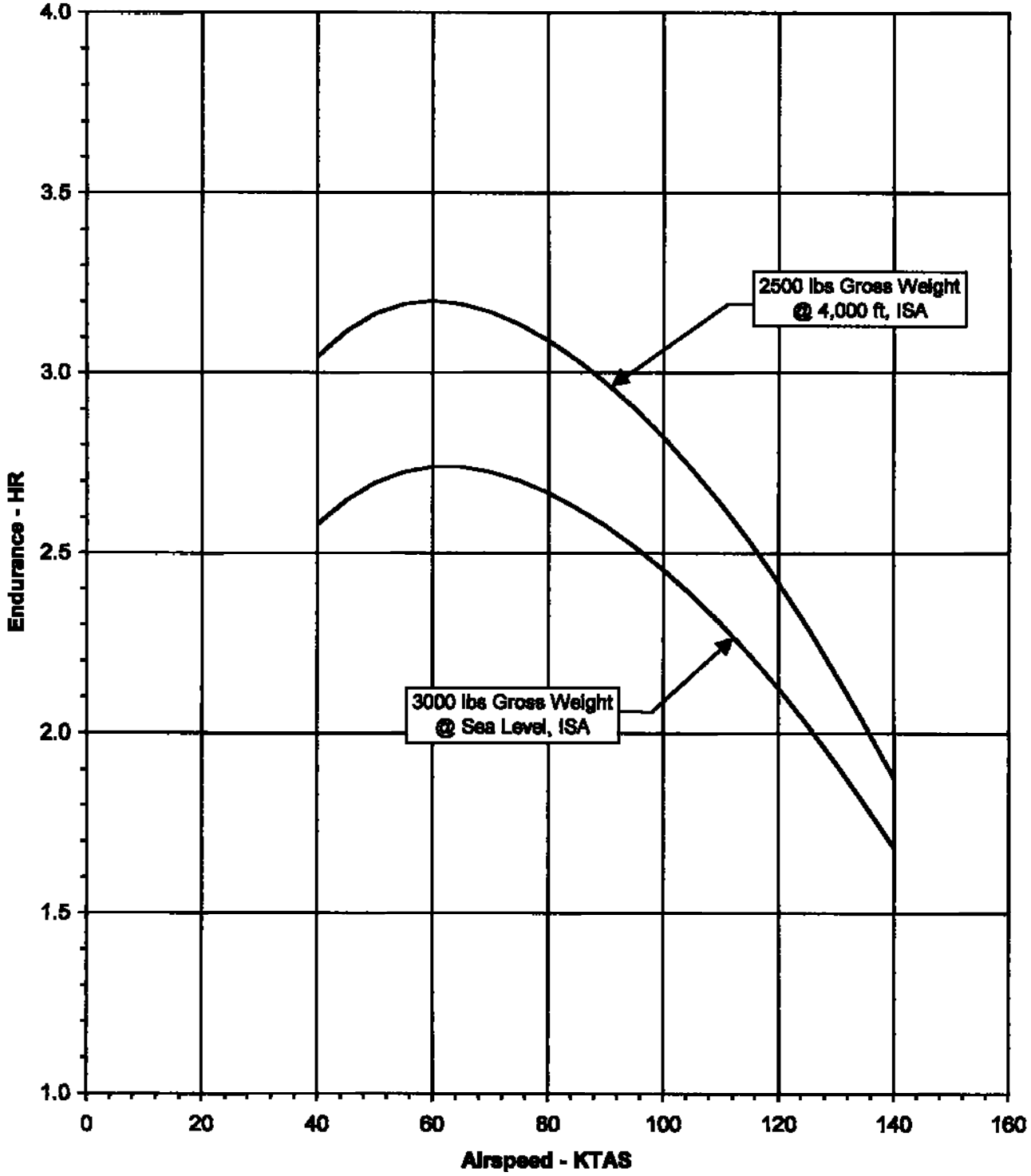
3.16 Payload vs Range (5000', ISA) (C20R Engine)



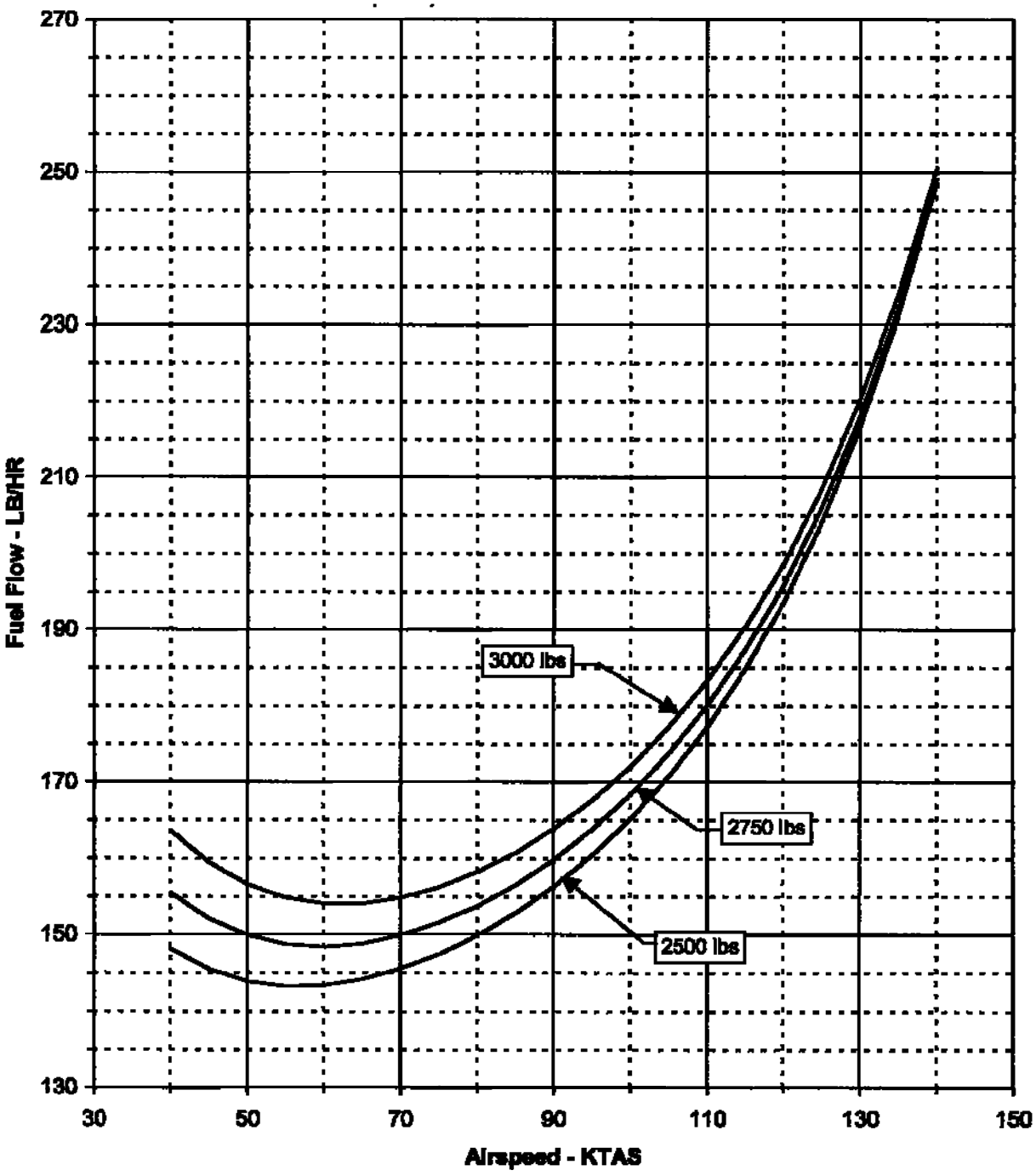
3.17 Speed for Best Range (C20R Engine)



3.18 Speed for Best Endurance (C20R Engine)

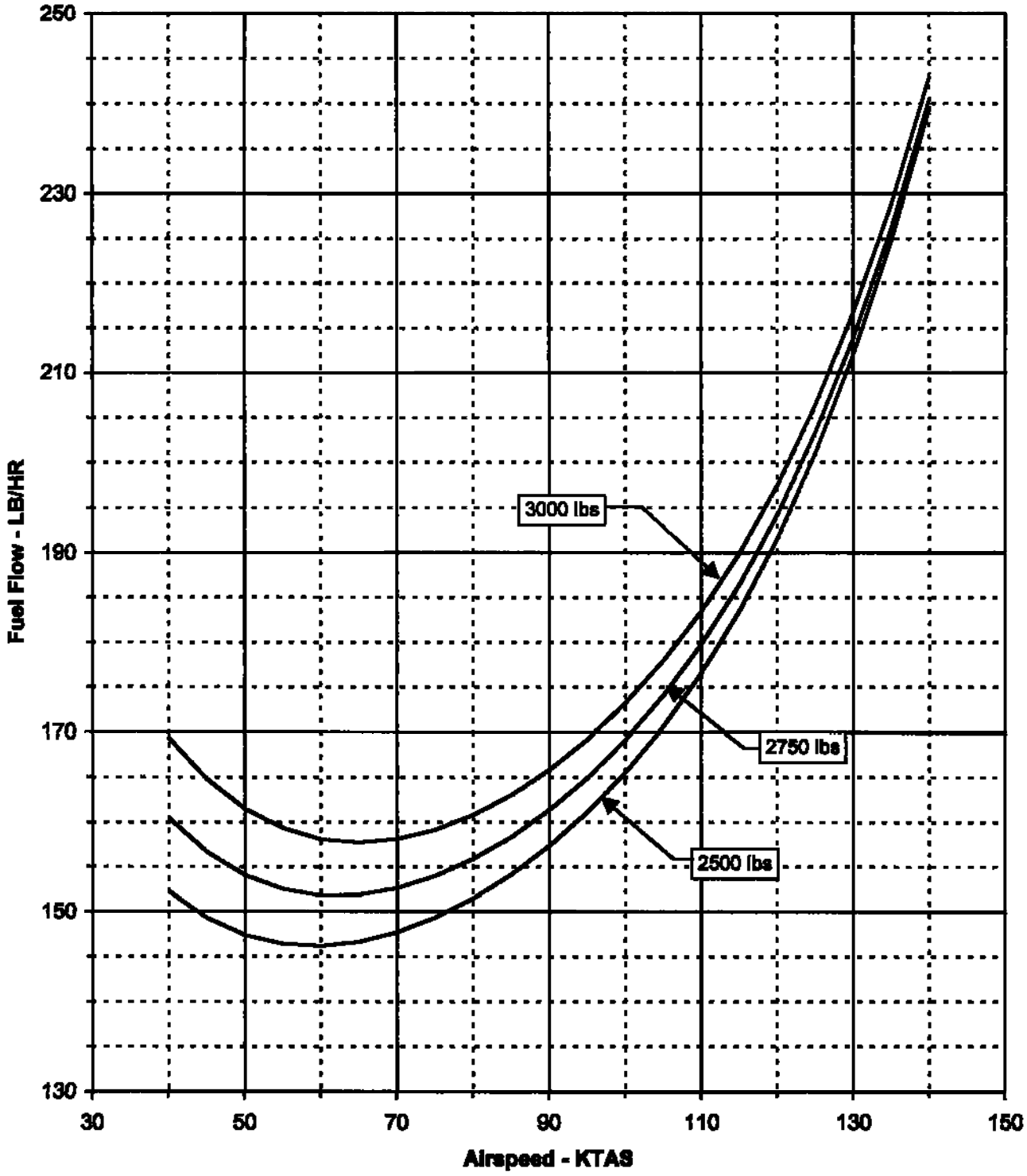


3.19 Fuel Flow, Sea Level, ISA (15°C) (C20R Engine)



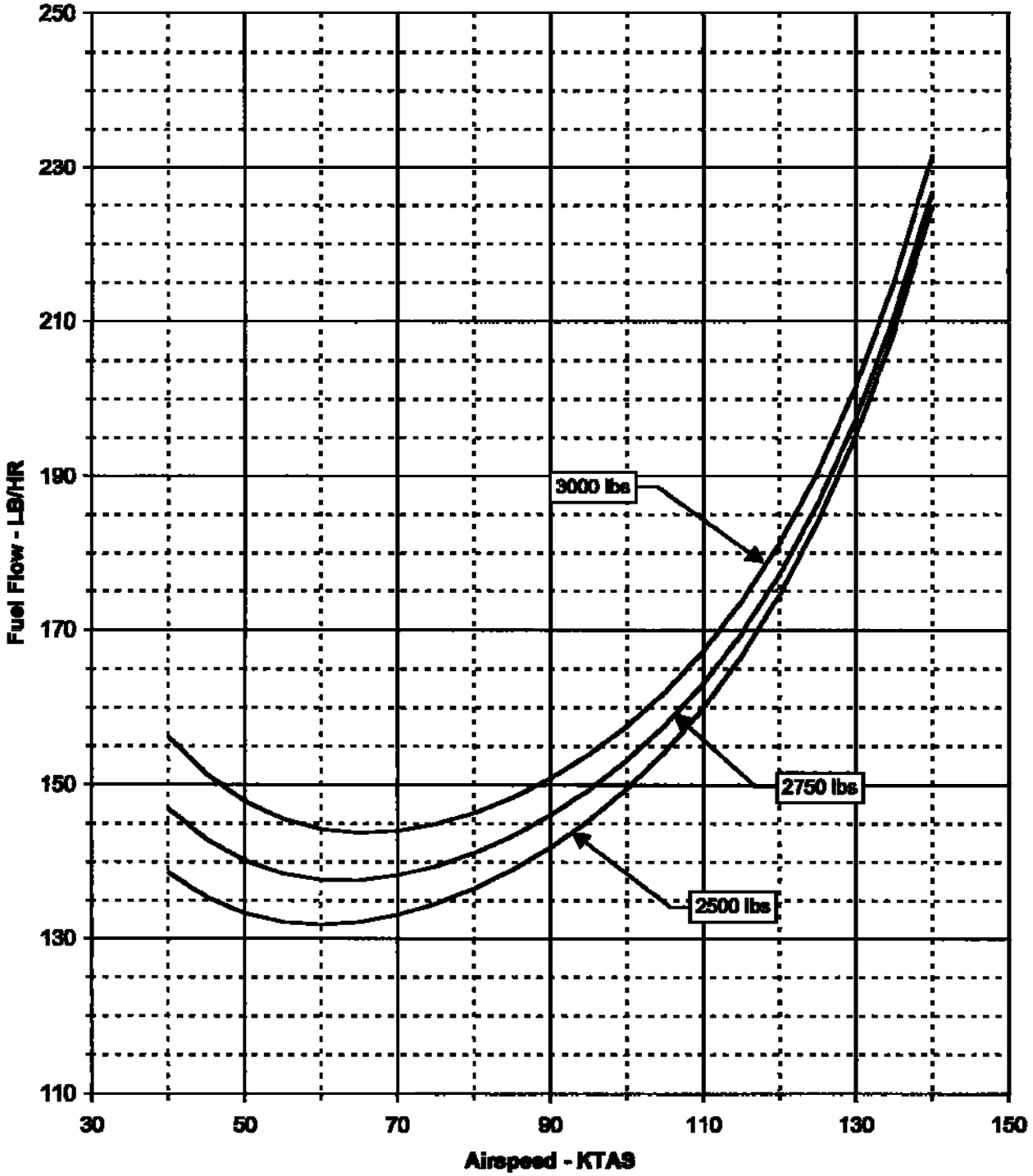
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load

3.20 Fuel Flow, Sea Level, ISA +20°C (35°C) (C20R Engine)



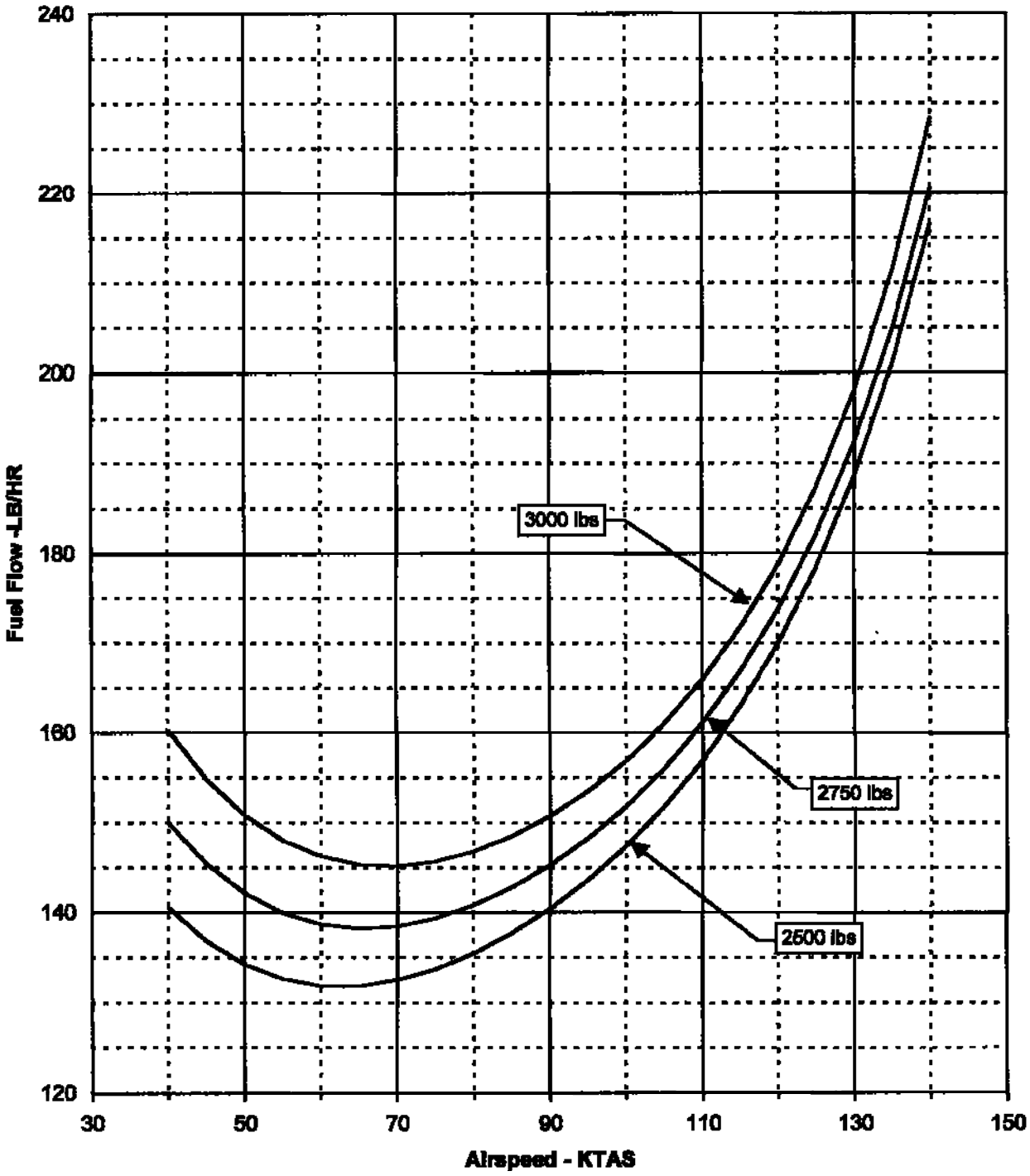
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

3.21 Fuel Flow, 4,000 feet, ISA (7°C) (C20R Engine)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

3.22 Fuel Flow, 4,000 feet, ISA +20°C (27°C) (C20R Engine)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

4.0 MD 500E® Estimated Direct Operating Cost Per Hour (Based upon year 2010 US$)

	C20B Engine	C20R+ Engine
Fuel and Lubricants [1]:		
Fuel @ $3.93* gallon @ approx. 27 gallons per hour.	$ 106.11	$ 113.97
Lubricants @ 3% of fuel	$ 3.18	$ 3.42
Total Fuel	**$ 109.29**	**$ 117.39**
Airframe Maintenance and Spares[2]:		
Maintenance labor costs:		
Scheduled (.15 Manhours/Flight Hours) @ $75.00/Hour*	$ 11.25	$ 11.25
Unscheduled (.26 Manhours/Flight Hours) @ $75.00/Hour*	$ 19.50	$ 19.50
	$ 30.75	**$ 30.75**
Spares Cost:		
Scheduled (Inspection) Parts: Used during periodic inspection i.e. filters, seals, o-rings, etc.	$ 5.78	$ 5.78
On-Condition/Unscheduled Part	$ 21.12	$ 20.11
Reserves: Component Overhaul (TBO)	$ 45.52	$ 45.52
Reserves: Limited-Life Parts	$ 42.72	$ 42.72
Total Airframe Cost	**$ 115.14**	**$ 115.14**
Engine[3]:		
Scheduled maintenance labor and parts	$ 3.00	$ 3.00
Reserve for engine overhaul, spares and accessories	$ 70.19	$73.20
Total Engine	**$ 73.69**	**$ 75.20**
Total Direct Operating Cost[4]	**$ 328.87**	**$ 338.48**

1 Fuel cost and labor rate* is based on U.S. Average
Average cost while operating under the following conditions:
Gross Weight: 10% less than maximum certified
Speed: Maximum Range Speed, 117 KIAS
Altitude: 1,000 feet on a standard day
2 Overhaul costs are based on participation in factory exchange program
3 Engine fleet maintenance costs provided by Rolls-Royce Engine Company
4 Indirect costs such as insurance, hangar, salary, etc., are excluded

Cost figures shown are extrapolated from a broad database and are intended for example purposes only. Actual costs will vary, depending on local operating condition, pricing and supplier practices. We encourage you top compare these figures with other manufacturers, using the same unit costs for fuel, labor, etc.

4.1 MD 500E® Direct Operating Cost Worksheet Fuel and Lubricants

■ Fuel and Lubricants

Fuel @ $ per gallon @ approx. gallons per hour…… $_____

Lubricants @ _____ % of fuel …….... $_____

Total Fuel and Lubricants Cost…….. $_____(A)

■ Airframe Maintenance and Spares

Scheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____)……..... $_____

Unscheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____) …….. $_____

Scheduled (Inspection) Parts …… $_____

On-Condition/Unscheduled Part …….. $_____

Reserves: Component Overhaul (TBO) …….. $_____

Reserves: Limited-Life Parts …… $_____

Total Airframe Maintenance and Spares Cost…….. $_____(B)

■ Engine

Scheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____) ……..... $_____

Unscheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____) __ …….. $_____

Reserves for engine overhaul and spares ……..... $_____

Total Engine Cost …… $_____(C)

TOTAL DIRECT OPERATING COST (A+B+C) **……** $_____(D)

FIXED OPERATING COST FIXED OPERATING COST

■ Depreciation

Hull insurance …….. $_____

Liability insurance …… $_____

Pilot salary …… $_____

Hangar rental …… $_____

Total Annual Fixed Operating Cost …… $_____(E)

Total Hours (_____) flown annually (F) **……** $_____(F)

TOTAL FIXED OPERATING COST PER HOUR (E+F) **……** $_____(G)

Total Direct Operating Cost Per Hour (from above) **……** $_____(D)

TOTAL HOURLY FIXED OPERATING COST (D+G)**……** $_____

5.0 Component Maintenance Schedule

Limited-Life Parts

Component	Finite Time (hr)
Main Rotor Blade	3,530
Blade Pin	7,600
Main Rotor Hub	8,900
Pitch Housing/MR	9,100
Retention Strap/MR	2.770
Bolt-Lead Lag/Mr	6,120
Lead Lag Link/MR	11,080
Drive Shaft	5,020
Mast	10,450
Transmission Coupling	4,300
T/R Drive Shaft	13,900
T/R Transmission Input Shaft	12,000
T/R Transmission Output Shaft	7,290
T/R Blade	5,140
T/R Hub	3,450
T/R Retention Strap	5,100
Tail Boom Bolts	21,950
Tail Boom	10,300
Vertical Stabilizer	12,700
Horizontal Stabilizer	7,700
Idler Bellcrank	6,500

Overhaul Systems

Component	Finite Time (hr)
Transmission/MR	5,000
M/R Swashplate	2,770
M/R Hub	2,770
Overrunning Clutch	1,800
T/R Transmission	4,800
Starter, Generator	1,200
Blower Bearings	1,200
Blower Belt	1,200

6.0 MD 530F® Features and Benefits

The MD 530F® is engineered to meet your requirements for hot-day, high-altitude operation. Equipped with the 650 shp Rolls-Royce 250-C30 engine, the MD 530F® operates more effectively in hot, high environments than other helicopters in its class. It offers the performance you need...at a lower cost of ownership.

In a typical working configuration, at a design gross weight of 3,100 lb (1406 kg) and a useful load of over 1,509 lb (684 kg), it can hover out-of-ground effect at 11,600 ft (3536 m) ISA + 20°C. Cruise speed follows the tradition of the MD 500E®, making it one of the fastest helicopters in its class. An optional cargo hook rated for 2,000 lb (907 kg) provides outstanding external load capability. Internal loading is made easy by the flat aft cargo compartment floor of the helicopter.

The high altitude lift capability of the MD 530F® is achieved by main-rotor blades six inches longer than the MD 500E®. The tailboom is extended eight inches and the tail rotor blades have been lengthened to provide increased thrust and directional control at high altitudes.

The MD 530F® features the same streamlined, extended nose and interior design as the MD 500E®, making it the most versatile MD helicopter. The T-shaped instrument panel provides space for a full complement of avionics.

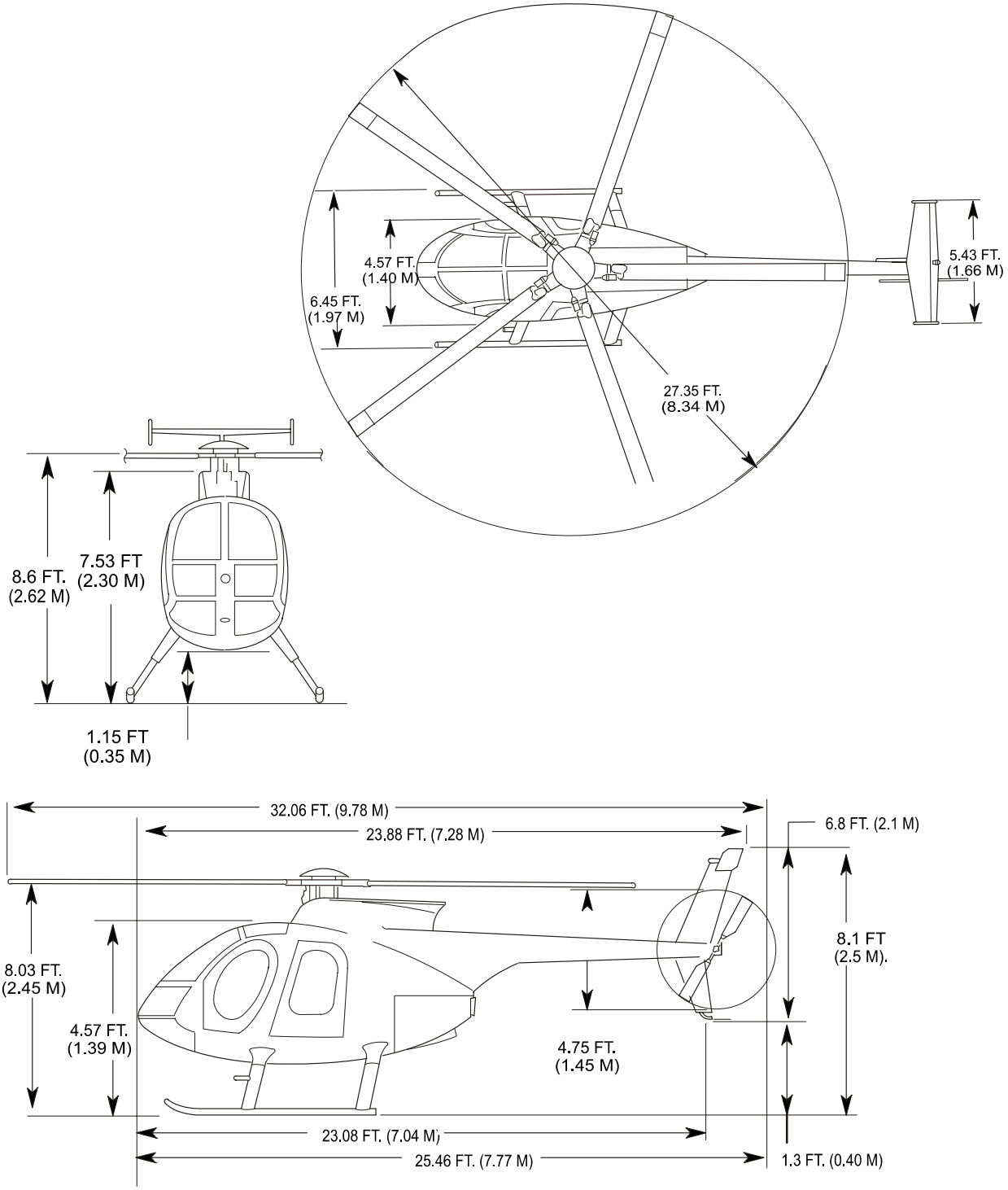
Rear seat passengers have increased headroom and visibility. The MD 530F® light turbine helicopter allows easy conversion to a utility cargo carrier. The aft compartment is roomy enough to carry two 55-gallon drums on a flat floor. Outsized, bulky loads can be carried externally by the cargo hook, which is rated at 2,000 lb (907 kg). Standard high-clearance skids permit operation in rough terrain, while other optional equipment, such as inflatable floats and litter kit increase the versatility of the MD 530F®.

Proven reliability, fail-safe design and the worldwide network of factory-authorized service centers assure customer satisfaction.

- STANDARD COCKPIT INTERIOR

- STANDARD CABIN INTERIOR

6.1 Dimensions



NOTES

1. Helicopter on ground with full fuel. Typical attitude of cargo deck 5.3 degrees nose up.
2. Height-above-ground dimensions vary with installed equipment, center of gravity and terrain features.
3. If standard landing gear is installed, all vertical dimensions will be 0.3 m (1.0 ft) less.

7.0 MD 530F® Standard Equipment

*Required Options Included in Base Price as of 2008

Airframe

- Extended Landing Gear
- Rapid Door Removal Hinges (cockpit and cabin)
- Tinted Canopy Panels
- Tinted Door/window panel-left front
- Tinted Door/window panel-left rear
- Tinted Door/window panel-right front
- Tinted Door/window panel-right rear
- Rain Gutter Set
- Keyed Locks (4)
- Fuselage Hard Points
- Jacking Fittings
- Passenger Steps
- Anti-Collision Lights (2)
- Landing Light, nose mounted
- Position Lights

Interior

- LH Rotor Brake
- Heater Defogger System
- Crew Seats with 4-point Harness Restraint
- Passenger Seats with 3-point Harness Restraint
- Vinyl and Fabric Cushions
- Vinyl Interior Trim Panels
- Crew and Cabin Compartment Floor Carpet
- Map Case
- Fire Extinguisher
- First-Aid Kit
- Cabin 28-volt Utility Outlet
- Battery-Heavy Duty Marathon 17-ampere-hr
- Fresh Air Ventilation System
- Cockpit Utility Light
- Instrument Lighting
- Cabin Soundproofing
- Cargo Tie-Down Fittings
- Cabin Convenience Light

Rotors and Controls

- Dual LH Command Flight Controls

MD 530F
STANDARD EQUIPMENT

Engine and Electrical

- Rolls-Royce 250-C30 Engine, 650 shp (485 kw)
- Automatic Engine Reignition
- Engine Wash Kit, MD 500 series
- 64 Gallon (242 L) Fuel System 85 amp Starter Generator
- 200 amp Starter Generator
- External Power Receptacle
- Engine Anti-Ice

Flight and Engine Instruments

- AFS Engine Inlet Barrier Filter
- Facet Oil Filter
- Dual Tachometer, NR and N2
- Engine Oil Pressure Indicator
- Engine Torque Meter
- Engine Oil Temp Indicator
- N1 Tachometer
- Fuel Quantity Indicator
- Digital Chronometer
- Airspeed Indicator
- Barometric Altimeter
- DC Ammeter
- Outside Air Temperature Indicator
- Magnetic Compass
- Turbine Outlet Temp Indicator

Annuciator Panel

- Battery Overtemp Warning Light
- Engine Chip Detector Warning Light
- Engine Out Warning Light
- Fuel Filter Obstruction Warning Light
- Fuel Low Warning Light
- Generator Out Warning Light
- Low Rotor rpm Warning Light
- Main Transmission Chip Detector Warning Light
- Main Transmission Oil Pressure Warning Light
- Main Transmission Oil Temperature Warning Light
- Tail Rotor Transmission Chip Detector Warning Light

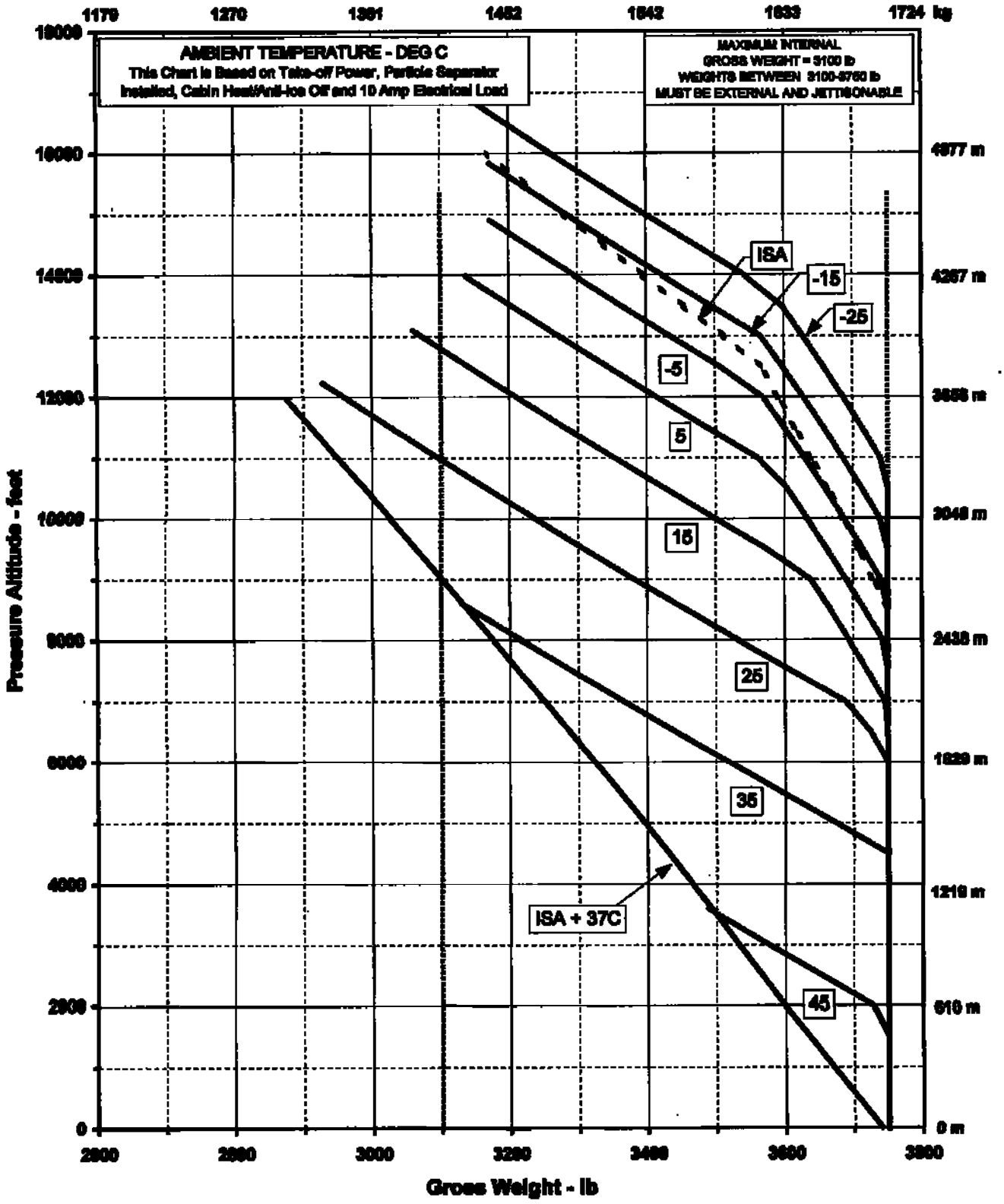
Miscellaneous

- Ground handling wheels
- Engine and airframe log books
- Engine maintenance manual
- Battery logbook
- Flight manual
- Handbook of maintenance instructions
- Illustrated parts catalog
- Engine exhaust cover
- Engine inlet cover
- Pitot Tube Cover
- Main Rotor Blade Tie-Downs
- One color paint

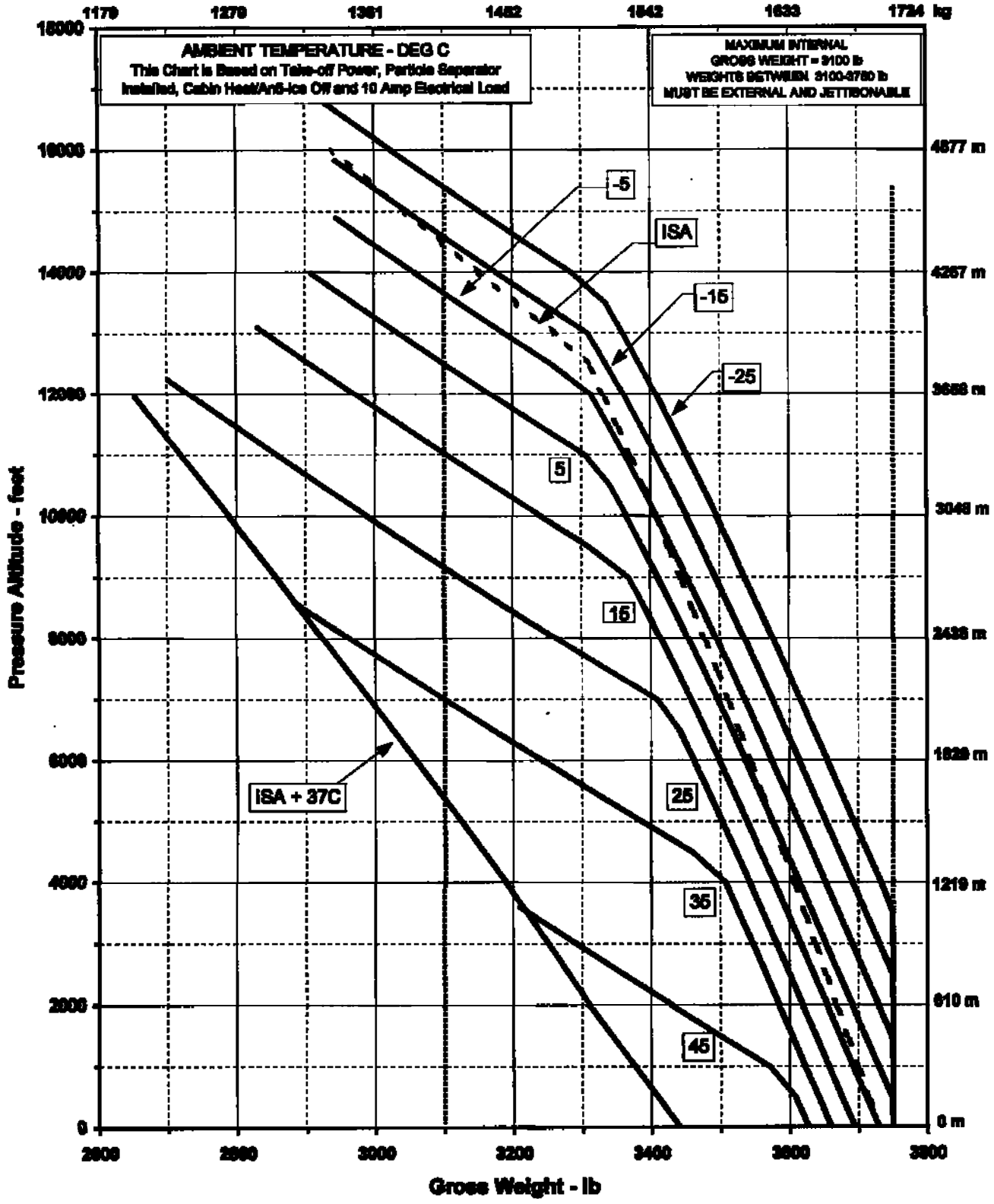
8.0 Performance Specifications

Characteristics at Design Gross Weight		Metric 1406 kg	Imperial 3,100 lb
Maximum Cruise Speed	Sea Level 1524 m (5,000 ft)	248 km/hr 249 km/hr	134 kt (154 mph) 135 kt (155 mph)
Speed for Best Range	1524 m (5,000 ft)	243 km/hr	118 kt (219 mph)
Maximum Permitted Speed	V_{NE} at sea level	282 km/hr	152 kt (175 mph)
Maximum Range	Sea Level 1524 m (5,000 ft)	2.2 hrs 430 km	2.2 hrs (237 m) 232 nm (267 m)
Maximum Endurance	Sea Level	381 km	206 nm (237 m)
Maximum Rate of Climb	Sea Level, Standard Day ISA +20° C Day	10.5 m/sec 105 m/sec	2069 fpm 2061 fpm
Maximum Operating Altitude	Density Altitude	6096 m	20,000 ft
Service Ceiling	ISA	5700 m	18,700 ft
Maximum Hook Capacity		907 kg	2,000 lb
Hovering Performance (No wind)			
In-ground effect	Standard Day ISA +20° C Day	4877 m 4359 m	16,000 ft 14,300 ft
Out-of-ground effect	Standard Day ISA +20° C Day	4389 m 3536 m	14,400 ft 11,600 ft
WEIGHTS			
Characteristics		**Metric**	**Imperial**
Maximum Gross Weight	Normal Capacity External Load Operations	1406 kg 1701 kg	3,100 lb 3,750 lb
Empty Weight	Standard Configuration	722 kg	1,591 lb
Useful Load	Normal Capacity	684 kg	1,509 lb
External Load Operations		979 kg	2,159 lb
Usable Fuel Capacity	242 l (64 gal)	183 kg	403 lb
POWER PLANT			
Characteristics		**Metric**	**Imperial**
Rolls-Royce 250-C30 gas turbine	Rated Power	485 kw	650 shp
Derated for reliability and safety to	Takeoff Power Max Continuous Power	317 kw 280 kw	425 shp 375 shp

8.1 Hover-In-Ground-Effect



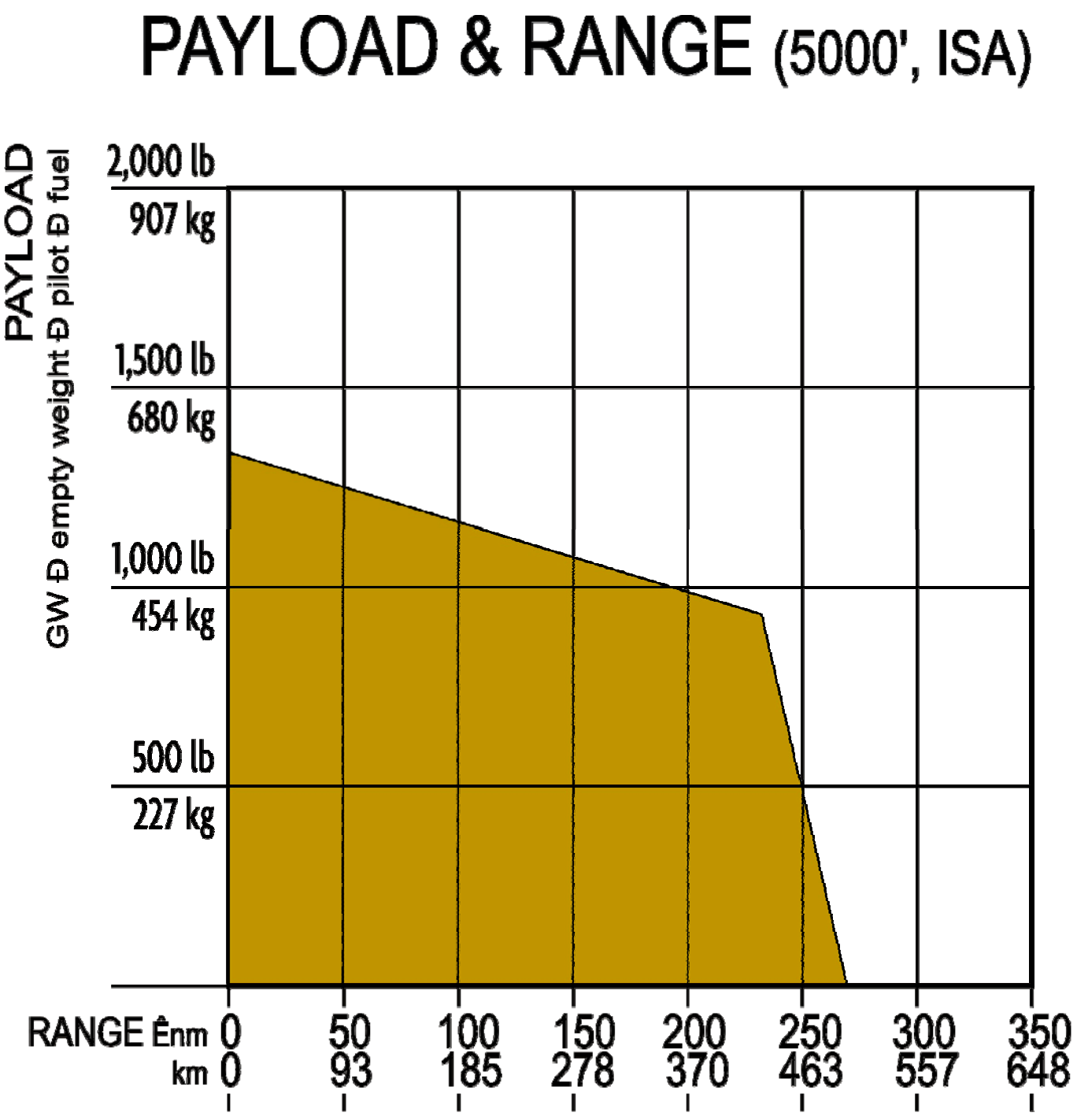
8.2 Hover-Out of-Ground-Effect



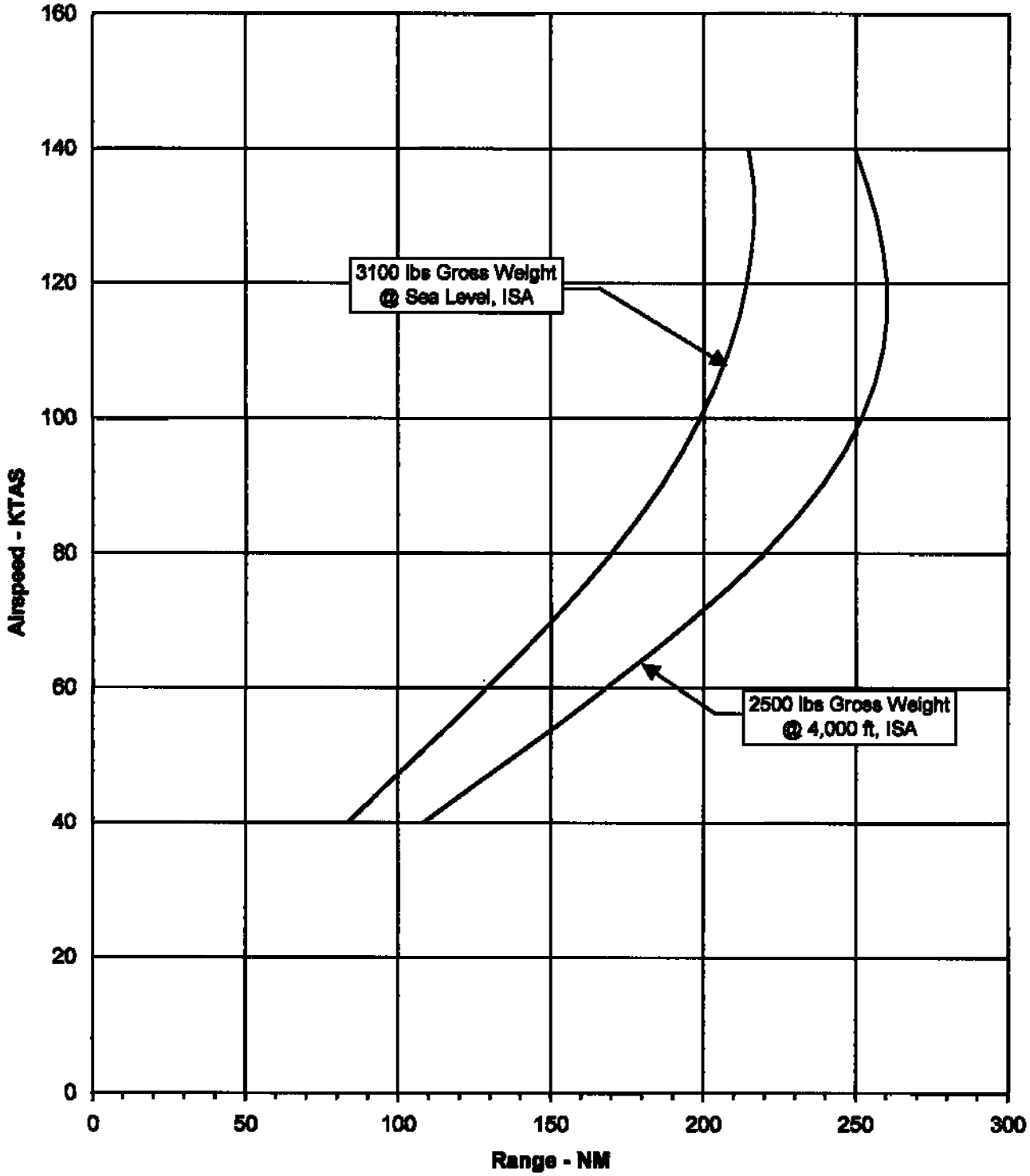
8.3 Takeoff Gross Weight Worksheet

	Example	Mission #1	Mission #2
Empty Weight	1,591 lb (722 kg)		
Pilot	170 lb (77 kg)		
Fuel	403 lb (183 kg)		
Payload	936 lb (424 kg)		
Takeoff GW	3,100 lb (1406 kg)		

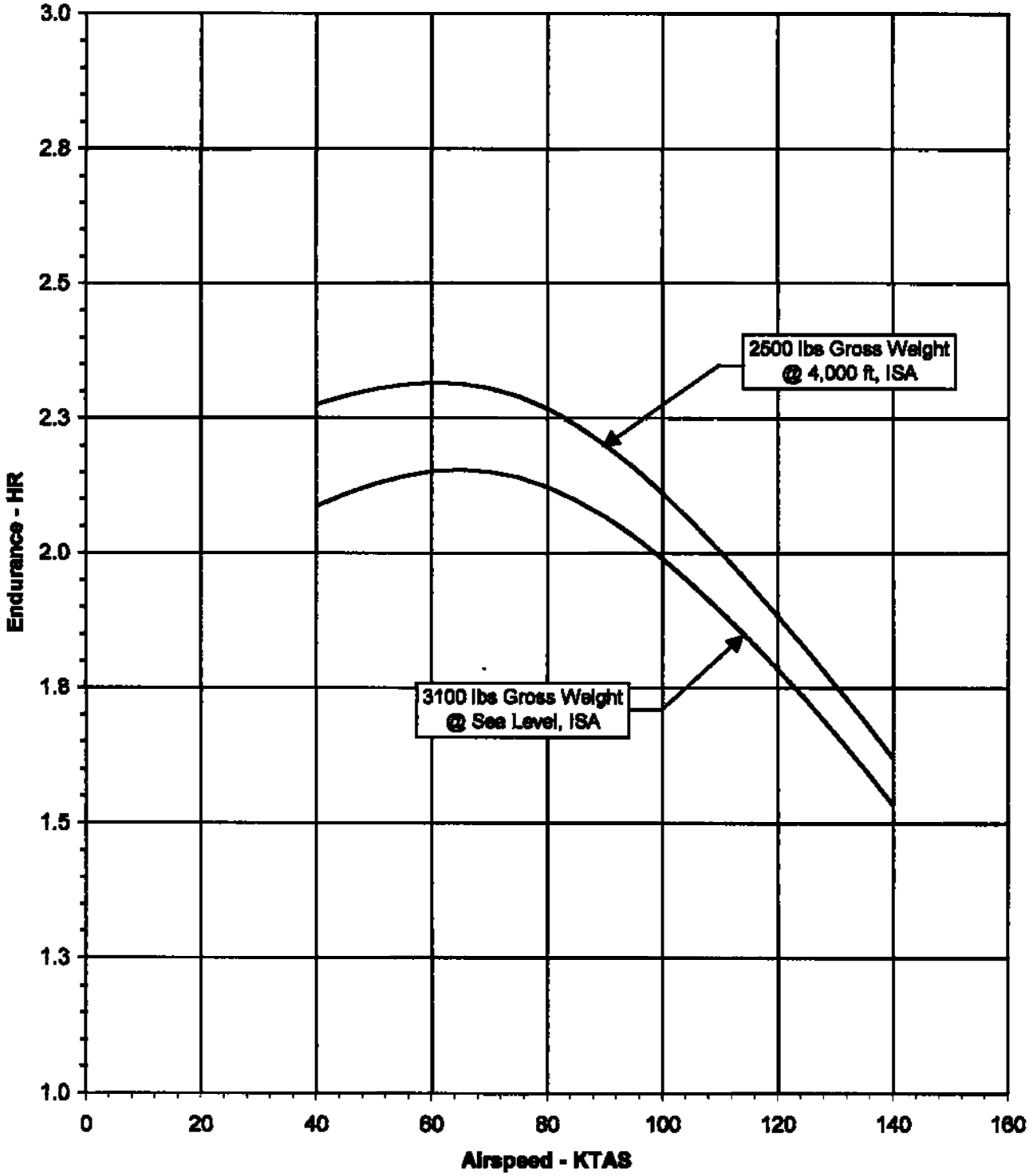
8.4 Payload vs Range (5000’, ISA)



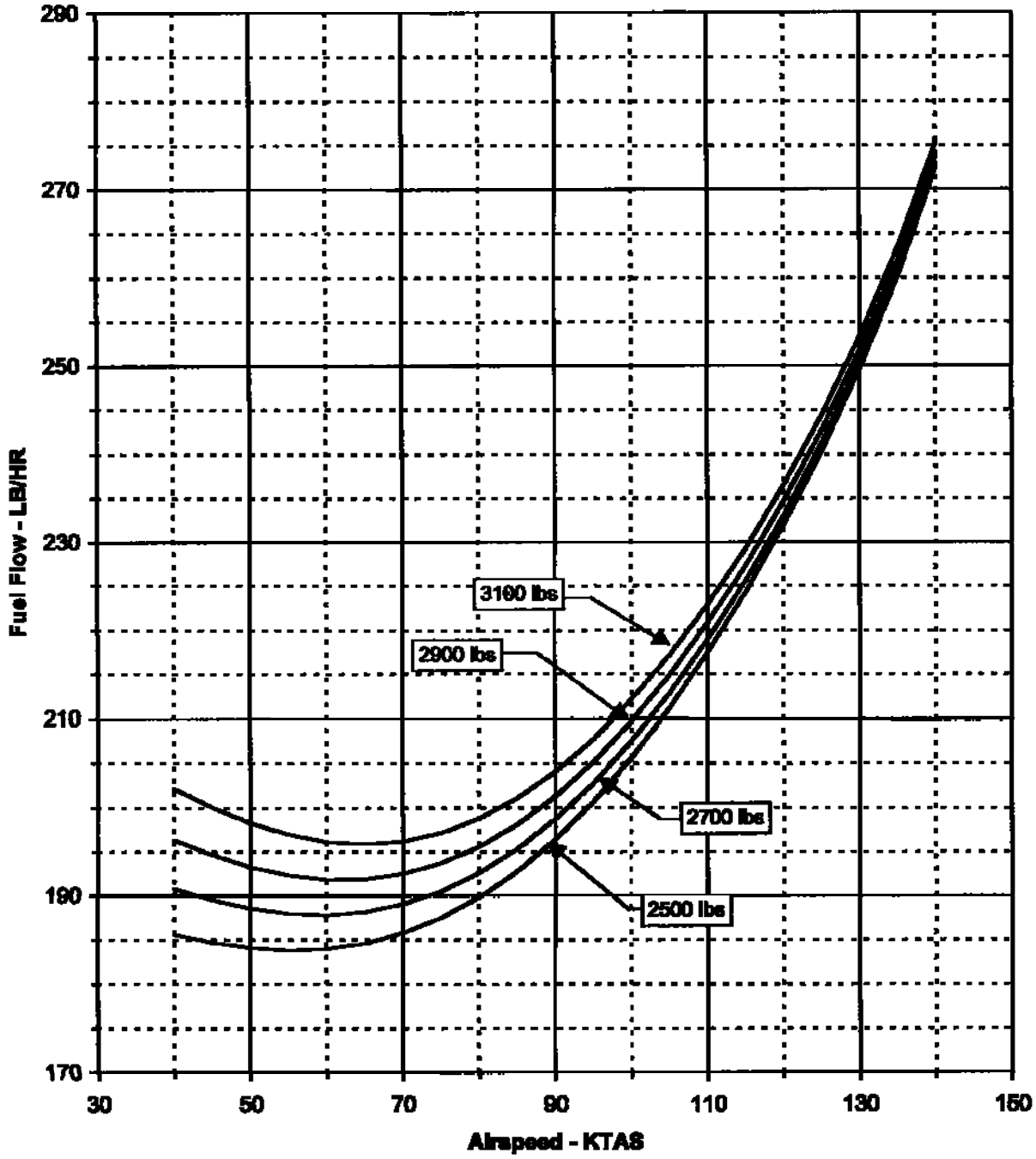
8.5 Speed for Best Range



8.6 Speed for Best Endurance

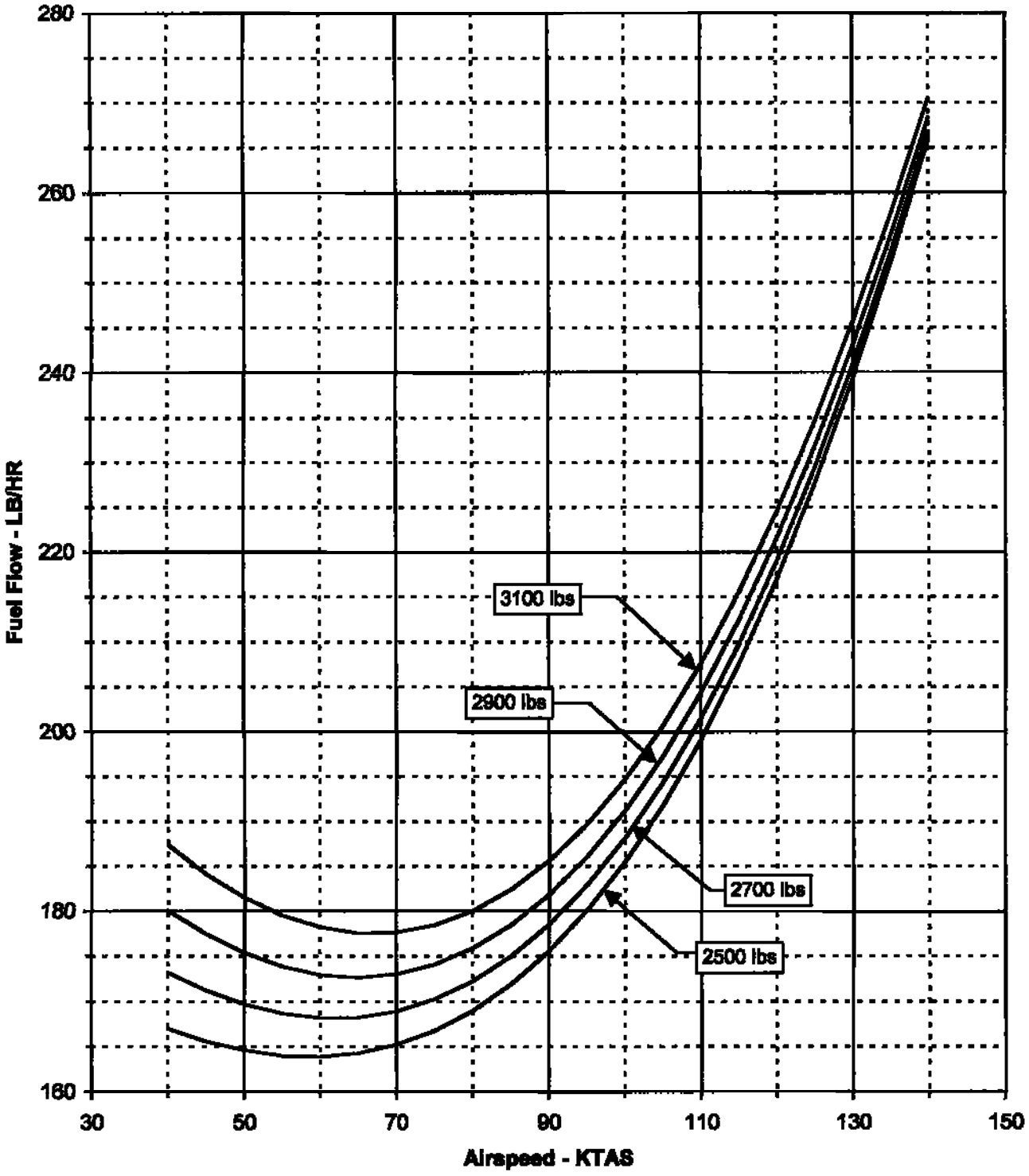


8.7 Fuel Flow, Sea Level, ISA (15°C)



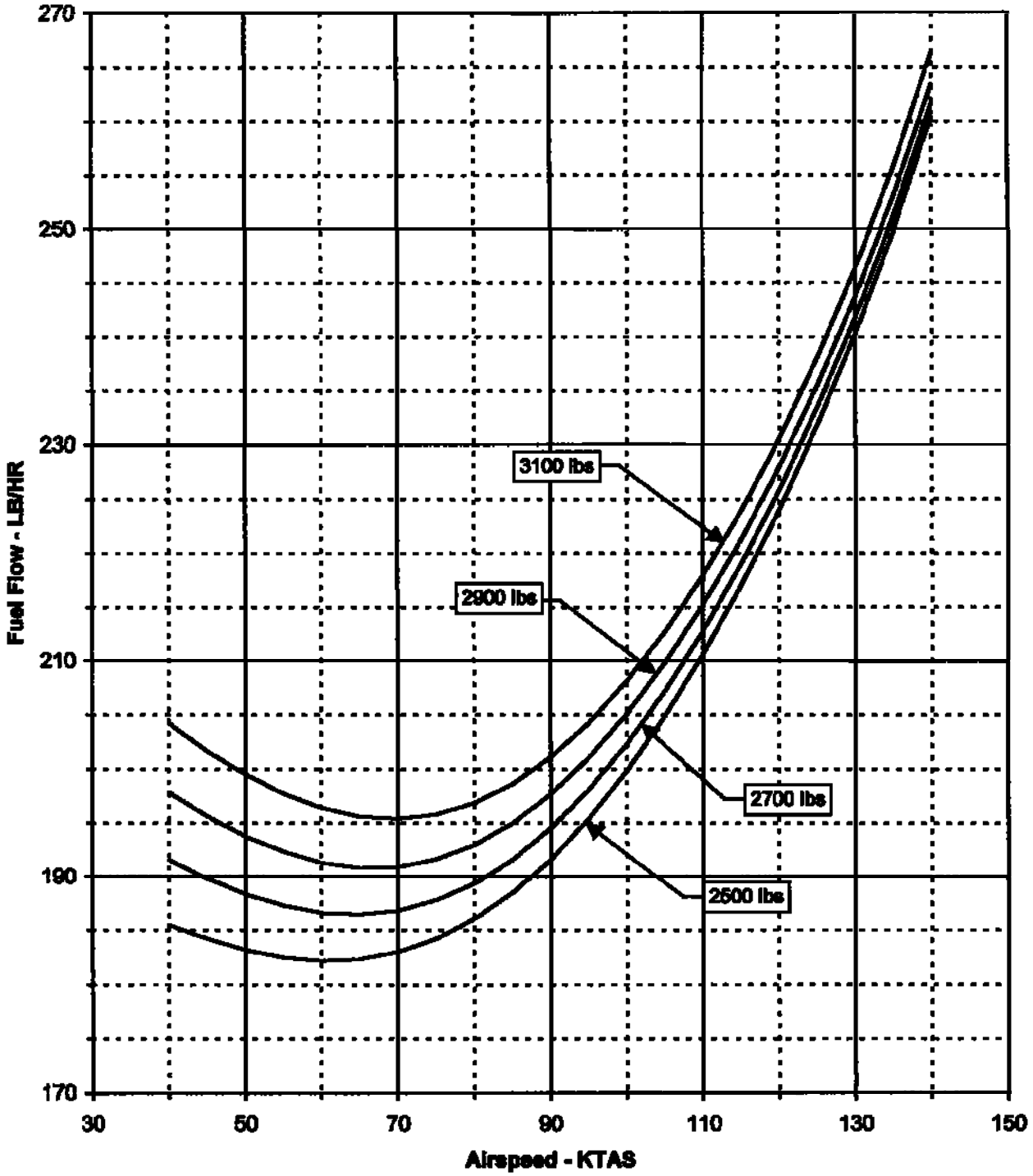
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

8.8 Fuel Flow, Sea Level, ISA +20°C (35°C)



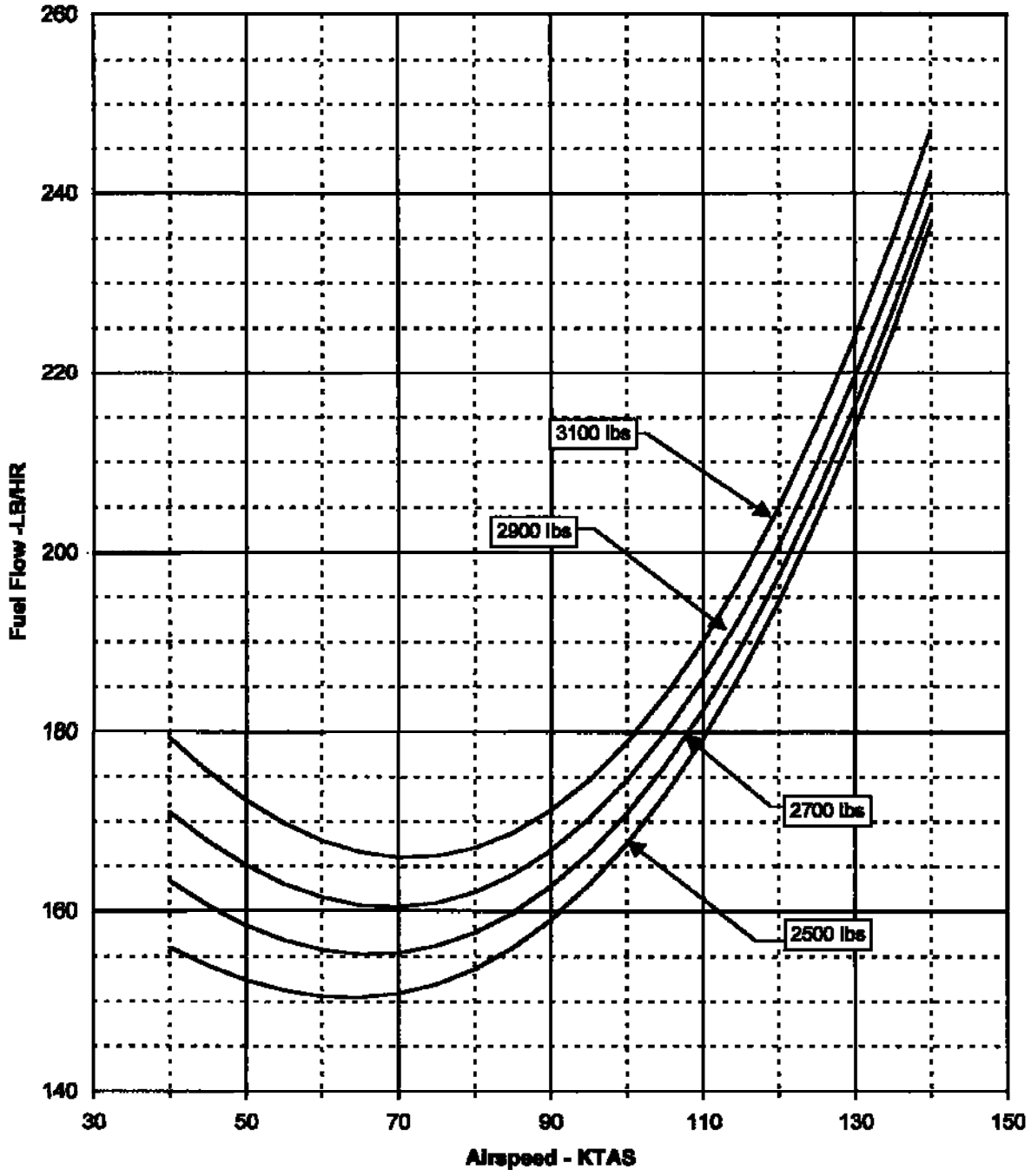
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

8.9 Fuel Flow, 4,000 feet, ISA (7°C)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

8.10 Fuel Flow, 4,000 feet, ISA +20°C (27°C)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

9.0 MD 530F® Estimated Direct Operating Cost Per Hour (Based upon year 2010US)

	C30 Engine
Fuel and Lubricants [1]:	
Fuel @ $3.93* per gallon @ approx. 35 gallons per hour.	$ 137.55
Lubricants @ 3% of fuel	$ 4.13
Total Fuel	**$ 141.68**
Airframe Maintenance and Spares[2]:	
Maintenance labor costs:	
Scheduled (.15 Manhours/Flight Hours) @ $75.00/Hour*	$ 11.25
Unscheduled (.26 Manhours/Flight Hours) @ $75.00/Hour*	$ 19.50
	$ 30.75
Spares Cost:	
Scheduled (Inspection) Parts: Used during periodic inspection i.e. filters, seals, o-rings, etc	$ 5.78
On-Condition/Unscheduled Part	$ 21.12
Reserves: Component Overhaul (TBO)	$ 46.93
Reserves: Limited-Life Parts	$ 48.92
Total Airframe Cost	**$ 122.75**
Engine[3]:	
Scheduled maintenance labor and parts	$ 3.00
Reserve for engine overhaul, spares and accessories	$ 70.91
Total Engine	**$ 73.91**
Total Direct Operating Cost[4]	**$ 369.09**

[1] Fuel cost and labor rate* is based on U.S. Average

Average cost while operating under the following conditions:
Gross Weight: 10% less than maximum certified
Speed: Maximum Range Speed, 124 KIAS
Altitude: 1,000 feet on a standard day

[2] Overhaul costs are based on participation in factory exchange program

[3] Engine fleet maintenance costs provided by Rolls-Royce Engine Company

[4] Indirect costs such as insurance, hangar, salary, etc., are excluded

Cost figures shown are extrapolated from a broad database and are intended for example purposes only. Actual costs will vary, depending on local operating condition, pricing and supplier practices. We encourage you top compare these figures with other manufacturers, using the same unit costs for fuel, labor, etc.

9.1 MD 530F® Direct Operating Cost Worksheet

- Fuel and Lubricants

Fuel @ $ per gallon @ approx. gallons per hour……..	$_____
Lubricants @ _____ % of fuel ……..	$_____
Total Fuel and Lubricants Cost……	$_____(A)

- Airframe Maintenance and Spares

Scheduled maintenance labor rate @ $ _____ per hour	
(Maintenance man-hour/flight hour=$ _____)……..	$_____
Unscheduled maintenance labor rate @ $ _____ per hour	
(Maintenance man-hour/flight hour=$ _____) ……	$_____
Scheduled (Inspection) Parts ……	$_____
On-Condition/Unscheduled Part ……	$_____
Reserves: Component Overhaul (TBO) ……	$_____
Reserves: Limited-Life Parts ……..	$_____
Total Airframe Maintenance and Spares Cost……	$_____(B)

- Engine

Scheduled maintenance labor rate @ $ _____ per hour	
(Maintenance man-hour/flight hour=$ _____) ……..	$_____
Unscheduled maintenance labor rate @ $ _____ per hour	
(Maintenance man-hour/flight hour=$ _____) __……	$_____
Reserves for engine overhaul and spares ……..	$_____
Total Engine Cost ……	$_____(C)
TOTAL DIRECT OPERATING COST (A+B+C) **……**	$_____(D)

FIXED OPERATING COST

- Depreciation

Hull insurance ……	$_____
Liability insurance ……	$_____
Pilot salary ……	$_____
Hangar rental ……	$_____
Total Annual Fixed Operating Cost ……	$_____(E)
Total Hours (_____) flown annually (F) **……**	$_____(F)
TOTAL FIXED OPERATING COST PER HOUR (E+F) **……**	$_____(G)
Total Direct Operating Cost Per Hour (from above) **……**	$_____(D)
TOTAL HOURLY FIXED OPERATING COST (D+G)**……**	$_____

10.0 Component Maintenance Schedule

Limited-Life Parts

Component	Finite Time (hr)
Main Rotor Blade	3,430
Blade Pin	7,600
Main Rotor Hub	8,900
Pitch Housing/MR	9,100
Retention Strap/MR	2,770
Bolt-Lead Lag/MR	6,120
Lead Lag Link/MR	11,080
Drive Shaft	3,675
Mast	10,450
Coupling	4,300
T/R Drive Shaft	14,610
T/R Transmission Input Shaft	3,365
T/R Transmission Output Shaft	7,290
T/R Blade	5,140
T/R Hub	3,450
T/R Retention Straps	5,100
Tail Boom	10,300
Vertical Stabilizer	3,388
Horizontal Stabilizer	7,700
Idler Bellcrank	6,500

Overhaul Systems

Component	Finite Time (hr)
Main Rotor Transmission	5,000
Main Rotor Swashplate	2,770
Main Rotor Hub	2,770
Overrunning Clutch	1,800
T/R Transmission	3,365
Starter Generator	1,200
Blower Bearings	1,200
Blower Belt	1,200

11.0 MD 520N® SYSTEM DESCRIPTION

Airborne Law Enforcement Configuration

Fast:	Vne of 175 miles per hour (250 kph) 154 miles per hour cruise speed (244 kph)
Agile:	Zero 0.5 g maneuvers NOTAR system precision attitude/directional control
Powerful:	Useful load at maximum gross weight 1,764 pounds (800 kg) internal 2,264 pounds (1027 kg) external HOGE at 6,000 ft (1829 m) @ISA HIGE at 11,200 ft (3414 m) @ISA ROC of 1,775 feet per minute (9.0 m/s)
Versatile:	20,000 foot (6096 m) Maximum Operating Altitude Operating temperature range of -40˚C to +52˚C 15 degree slope landing
Safety:	Elimination of tail rotor hazards
Environment:	Quiet operations – Flyover at 500 feet AGL = 72.5 dbA

11.1 MD 520N® Design Description

The MD 520N® is a fast, agile, lightweight, turbine powered, all-purpose helicopter. Advanced technology has been used in the design and construction of the aircraft, resulting in excellent speed capabilities, high payload-to-empty-weight ratio, passenger/crew safety and handling and performance capabilities.

The MD 520N® has been designed to allow a wide variety of rapid configuration options. The aircraft may be converted rapidly from a personnel transport to a utility cargo configuration. Typical uses include:

- Airborne Law Enforcement
- Search and rescue
- Surveillance and crowd control
- Aerial survey, patrol and photographic missions
- Forestry and fire fighting applications

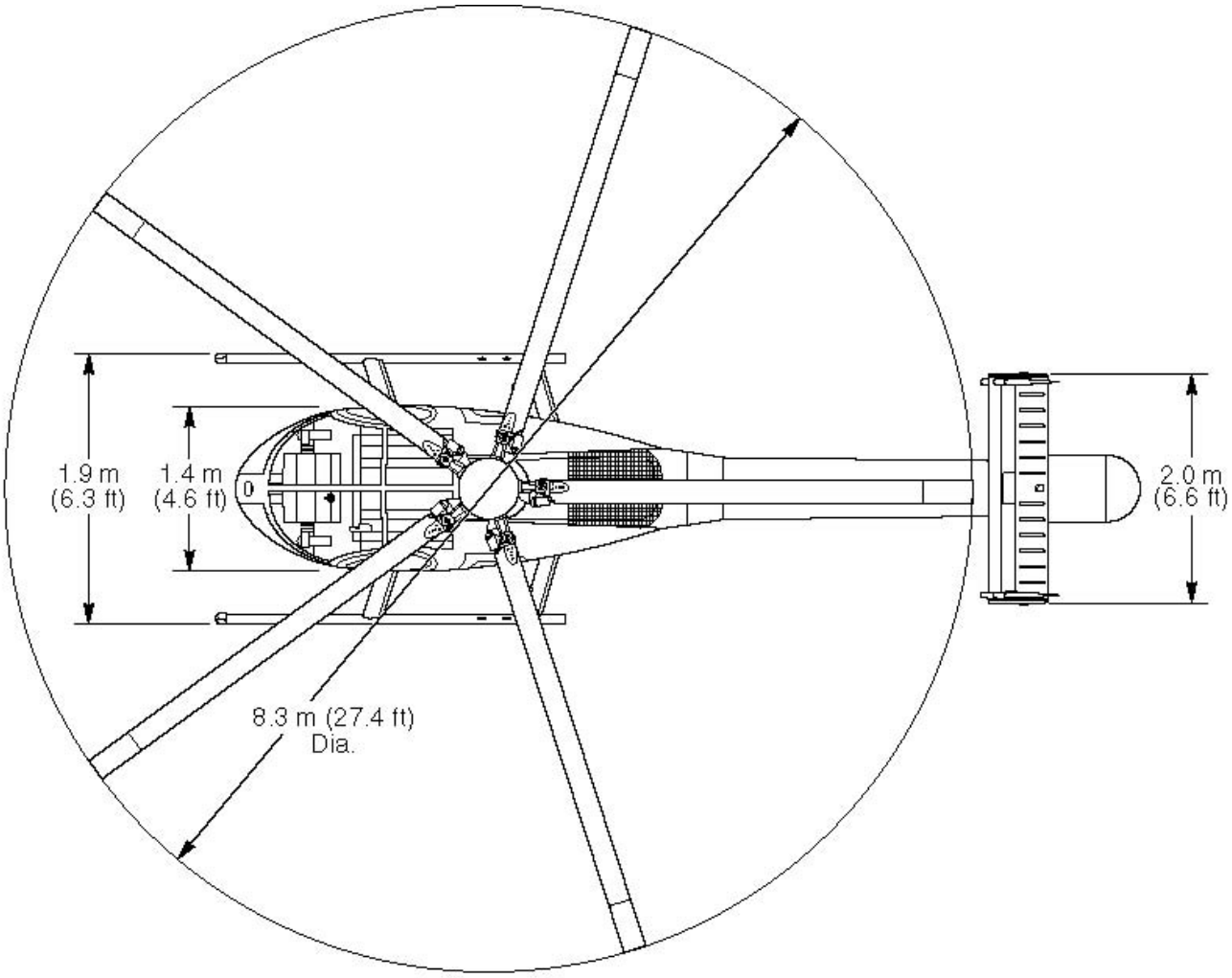
The MDHI MD 520N® helicopter is a turbine powered, rotary-wing aircraft constructed primarily of aluminum alloy while the NOTAR® system components are primarily graphite composites. The main rotor is a fully articulated five-bladed system that provides excellent control and maneuverability characteristics. Power from the turboshaft engine is transmitted through the main drive shaft to the main rotor transmission. The main transmission drives an intermediate gearbox to the NOTAR® system fan. An over-running (one-way) clutch placed between the engine and main rotor transmission, permits freewheeling of the rotor system during autorotation.

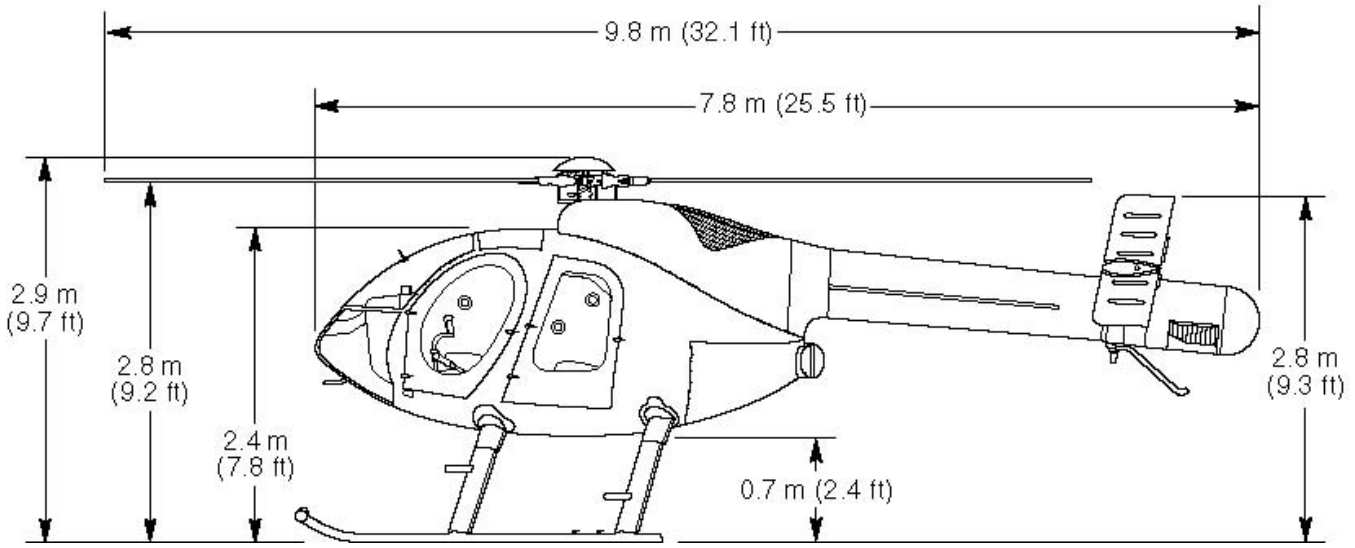
The airframe structure is egg-shaped and provides very clean aerodynamic lines. A rigid, three-dimensional truss-type structure increases crew safety by means of its roll bar design and reduces the potential for airframe collapse into the crew and passenger compartments. The airframe structure is designed to be energy absorbing while maintaining rotor hub integrity.

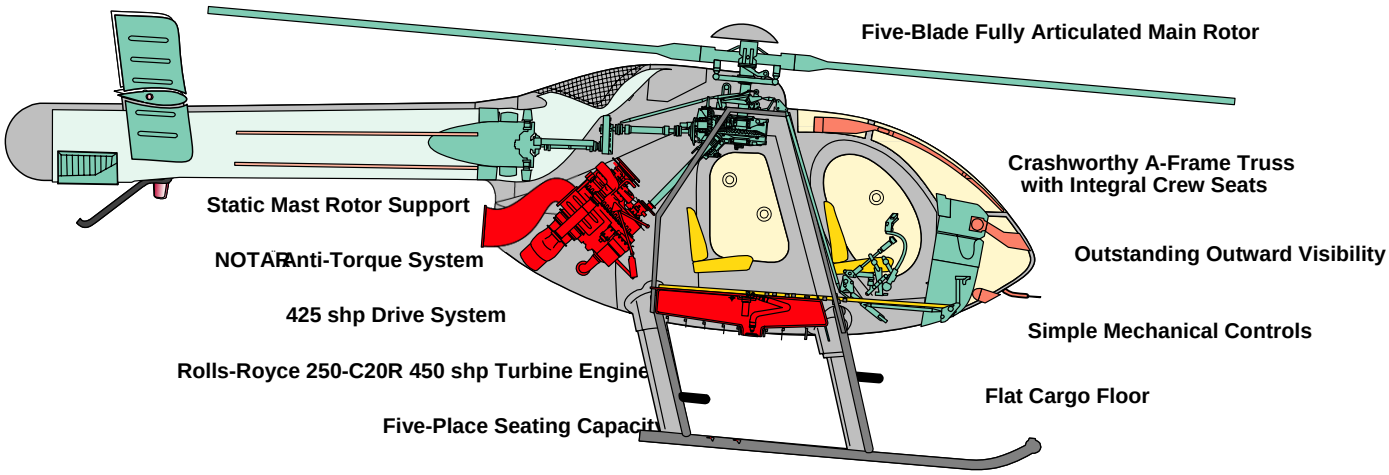
11.1.1 MD 520N® Outside Dimensions

The fuselage is a semi-monoque structure that is divided into two main sections. The forward section is composed of the pilot/co-pilot compartment and directly aft, separated by a bulkhead, a cabin compartment. The pilot compartments equipped with seats for the pilot and either two passengers on the co-pilot. A canopy of transparent tinted acrylic panels provides excellent visibility.

An instrument panel is located forward of the seat structure along the aircraft centerline. The panel incorporates standard flight and engine instruments in addition to warning and caution lights. The panel also contains adequate space for avionics and flight instruments. An optional “slant panel” is available that increases the panel space available when extensive avionics suites are selected or when armament systems are installed.


1.9 m
(6.3 ft)
1.4 m
(4.6 ft)
2.0 m
(6.6 ft)
8.3 m (27.4 ft)
Dia.


9.8 m (32.1 ft)
7.8 m (25.5 ft)
2.9 m
(9.7 ft)
2.8 m
(9.2 ft)
2.4 m
(7.8 ft)
0.7 m (2.4 ft)
2.8 m
(9.3 ft)


Five-Blade Fully Articulated Main Rotor
Crashworthy A-Frame Truss with Integral Crew Seats
Static Mast Rotor Support
NOTAR® Anti-Torque System
Outstanding Outward Visibility
425 shp Drive System
Simple Mechanical Controls
Rolls-Royce 250-C20R 450 shp Turbine Engine
Flat Cargo Floor
Five-Place Seating Capacity

11.1.2 MD 520N® Inboard Profile and Features

The crashworthy designed fuselage structure beneath the pilot/copilot floor contains space for the aircraft battery and provision for small cargo storage or installation of avionics equipment. Access to the compartments is through two floor panels.

The cargo compartment is the center of the aircraft contains provisions for the installation of passenger seats, auxiliary fuel tanks or cargo/baggage. During cargo-carrying operations, the compartment floor serves as the cargo deck. The cargo floor is designed to accommodate a range of cargo requirements.

The aft section includes the structure of the tailboom attachment, NOTAR® system fan and the engine compartment. Access to the engine compartment is provided through clamshell doors contoured to the shape of the fuselage.

The lower section is divided by the center “keel beam” and provides housing for the two fuel cells containing a total of 64 U.S. gallons (242 l) of fuel.

11.2 MD 520N® On Patrol

Four doors are installed on the MD 520N® - two on each side. The two forward doors permit access to the forward compartment for pilot and copilot/passengers. The two aft doors allow entry to the passenger/cargo compartment. The design permits flight with doors removed without major speed restrictions. Transparent tinted windows are contained in the doors.

A Rolls-Royce Model 250-C20RS gas turbine engine with a takeoff power rating of 450 shp powers the MD 520N®. Only 425 shp at l00 percent N2 rpm is used for takeoff; 375 maximum continuous shp provides power for all other flight modes.

An overrunning clutch transmits power from the engine to the main drive shaft. The clutch has no external controls and disengages automatically during autorotation and engine shutdown. The main drive shaft connects to the main rotor transmission input shaft. The engine oil cooler blower is belt-driven off the main drive shaft and draws cooling air from the air inlet fairing to supply ambient air to the engine and transmission oil coolers and to the engine compartment. The main rotor transmission is mounted on the airframe structure above the passenger/cargo compartment. The transmission is lubricated by its own air-cooled oil lubrication system. The main rotor static mast is non- rotating and is rigidly mounted to the fuselage mast support structure. This static mast is used to separate the lift and torque loads of the rotor.

Torque is transmitted independently to the rotor through an internal main rotor drive shaft. Lifting loads reacted by the static mast are prevented from being imposed through the drive shaft onto the main transmission, thus eliminating thrust loading of transmission parts. This accomplishes a design that reduces main transmission weight and reduces the probability of injury during a crash.

The MD 520N® utilizes a five-blade, fully articulated main rotor assembly. The MDHI strap pack design provides restraint and allows all three degrees of rotor hub and rotor blade travel. The strap configuration, while secured firmly to the hub, allows the centrifugal load exerted by one blade to be countered by the force exerted by the opposite two blades.

Thus, very light centrifugal loads are sensed by the hub. The “V” legs of the strap pack rotate as driving members to turn the blades and allow feathering, lead, lag and flapping of the blades. The main rotor blades are secured to the hub with quick-release lever type pins. Adjustable pedal controls are provided for rudder/thruster control. Adjustable friction devices are incorporated in the cyclic, collective and throttle controls. In addition, electrical cyclic trim actuators allow flight loads to be trimmed out. Control forces are low; hence, a hydraulic boost system is not required.

The landing gear is a skid type attached to the fuselage at l2 points and is not retractable. Aerodynamic faring cover the struts. Nitrogen charged landing gear dampers act as springs and shock absorbers to cushion landings and provide ground resonance stability. Provisions for ground handling wheels are incorporated on the skid tubes.

11.2.1 Maintenance made easy

The MD 520N® incorporates proven engineering features that are unsurpassed for design simplicity, safety, reliability and ease of maintenance. There are no hydraulic boost systems, intermediate drive shaft bearings or grease fittings on any MD 500 series helicopters.

Blade Retention System:

The mechanical simplicity of the main rotor system provides high reliability at low cost. Main rotor blades are retained by an exclusive strap pack system that accommodates main rotor blade flapping, lead-lag and feathering motions. Fewer parts result in higher reliability.

Main Rotor Transmission:

The main transmission has four gears and two gear meshes. It is light but rugged for maximum reliability. The static mast design allows one mechanic to easily change the transmission without removing any other component on the rotor head.

11.2.2 Interchangeability

Parts and assemblies listed below are interchangeable:

1. Main rotor blade (tracking of new blades may be required)
2. Main rotor hub assembly
3. Lead-lag damper
4. Main rotor drive shaft
5. Main rotor mast
6. Main transmission
7. Overrunning clutch
8. Main drive shaft
9. Engine assembly
10. Engine mount
11. Engine exhaust duct
12. NOTAR drive shaft
13. NOTAR gearbox
14. NOTAR blades
15. Control system components
16. Oil tank
17. Oil coolers (engine and main transmission)
18. Tail boom assembly
19. Vertical and Horizontal stabilizers
20. Fuel cells (left and right)
21. Electronic component assemblies and associated wire harnesses
22. Instruments
23. Landing gear assembly

11.3 NOTAR® ANTI-TORQUE SYSTEM

Greater Safety:

- U.S. FAA, NTSB and U.S. Army Studies have shown that 21 percent of all crashes are due to tailrotor strikes or loss of tail rotor effectiveness. NOTAR® systems eliminate these problems.

Reduced Noise

- Designed and tested to be 50 percent quieter than any other helicopter. This results in detection distances that are far superior to other aircraft.

Reduced Pilot Workload

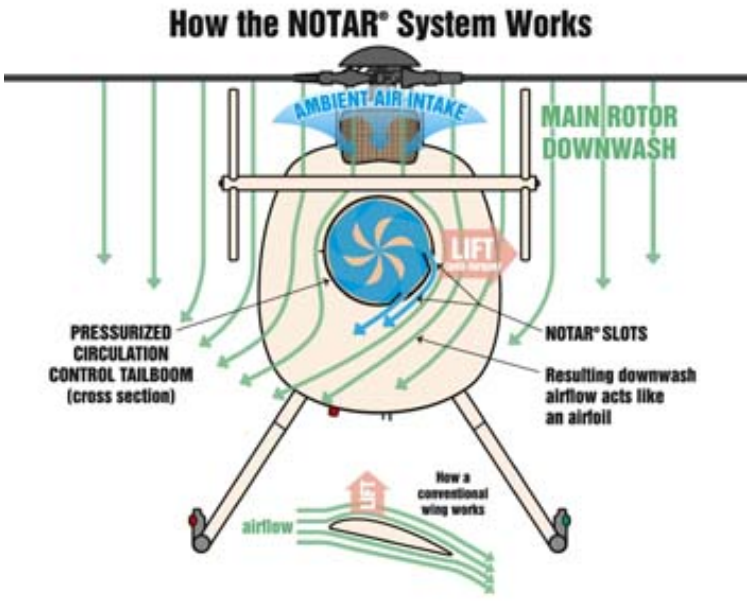
- Using the Coanda Effect to provide tail boom lift and anti-torque, the system is more stable and easier to control. This effect reduces the sensitivity to wind direction on helicopter control, through providing an important tactical advantage during combat operations.

Low Pressure Air System

- Since the NOTAR® system uses low-pressure air, it is not sensitive to holes made in the tailboom by fire from automatic weapons. Studies have shown the NOTAR® system is 60 percent less vulnerable to small arms fire than tail rotor systems on comparable helicopters.

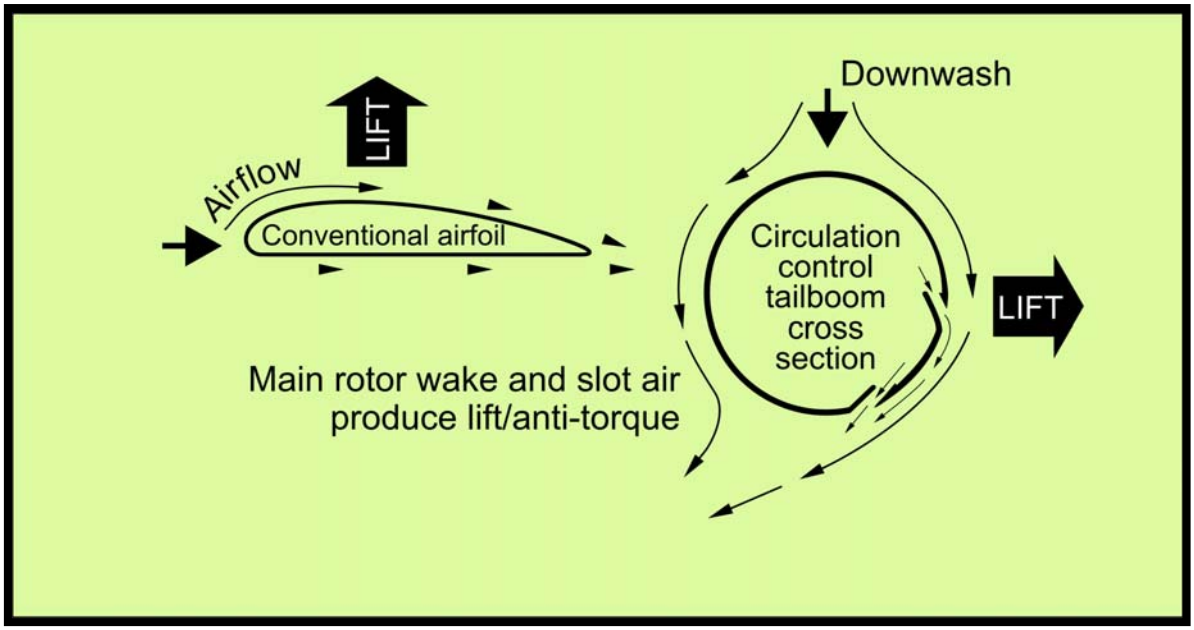
11.3.1 DESCRIPTION OF THE NOTAR® SYSTEM

The NOTAR® system is an anti-torque system made up of an enclosed fan driven by the main rotor transmission, a circulation control tailboom, a direct jet thruster and a horizontal stabilizer with two vertical stabilators.



11.3.2 NOTAR® System Components

The vertical stabilizers are connected to the pilot's anti-torque (rudder) pedals. The left stabilizer moves through approximately 29 degrees of motion and provides sufficient control power for autorotation. It serves the additional purpose of unloading the thruster during forward flight to permit optimum cruise performance.



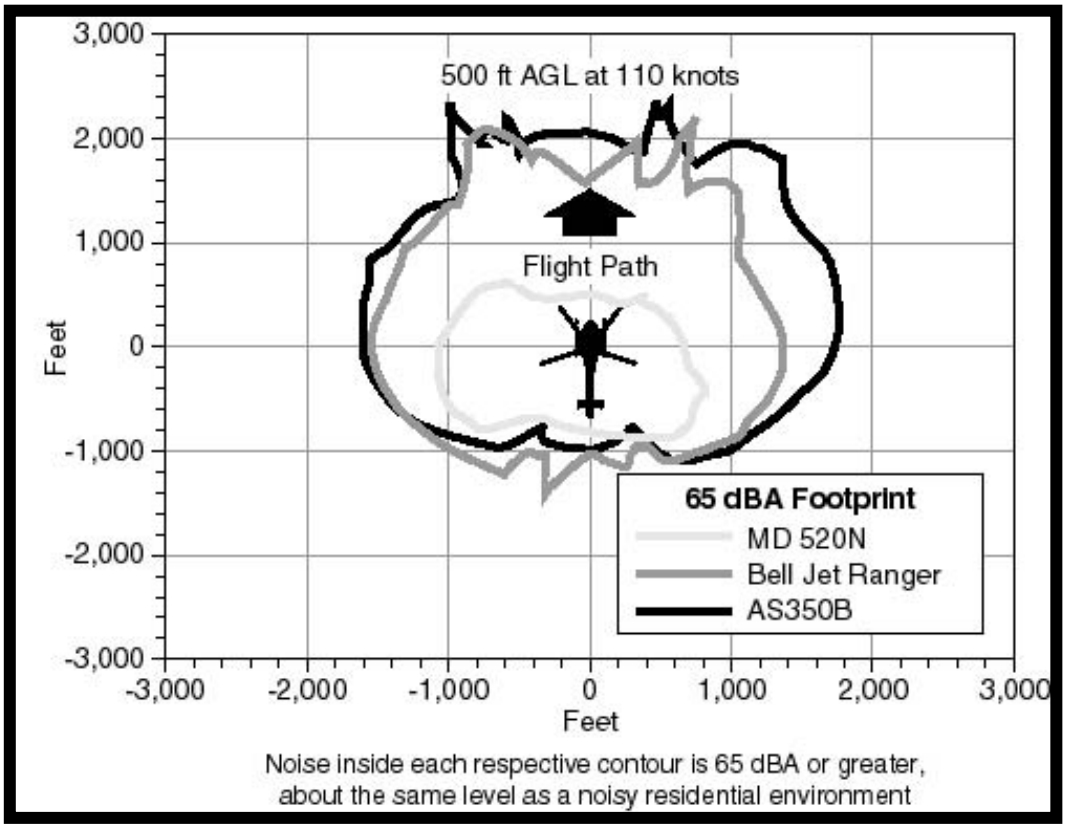
In hover flight, the circulation control tail boom provides the majority of the required main rotor anti-torque. This is accomplished by two slots along the tailboom that energize the downwash flow from the main rotor. The result is lift in a horizontal direction that replaces the push of a conventional tail rotor. The direct jet thruster provides the remaining anti-torque and maneuverability for yaw control and directional changes. In forward flight, the vertical stabilators, in conjunction with the direct-jet thruster, provide the required anti-torque and directional control.

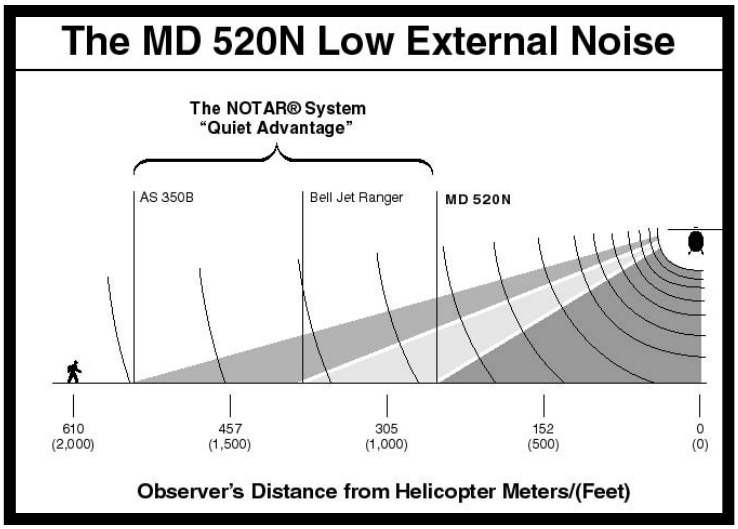
11.3.3 REDUCED AIRCRAFT VIBRATION

The inherent stability of the standard MD 500 is further improved by the elimination of the exposed tail rotor assembly, which reduces overall helicopter vibrations and increases passenger comfort while reducing pilot fatigue.

11.3.4 LOW EXTERNAL NOISE

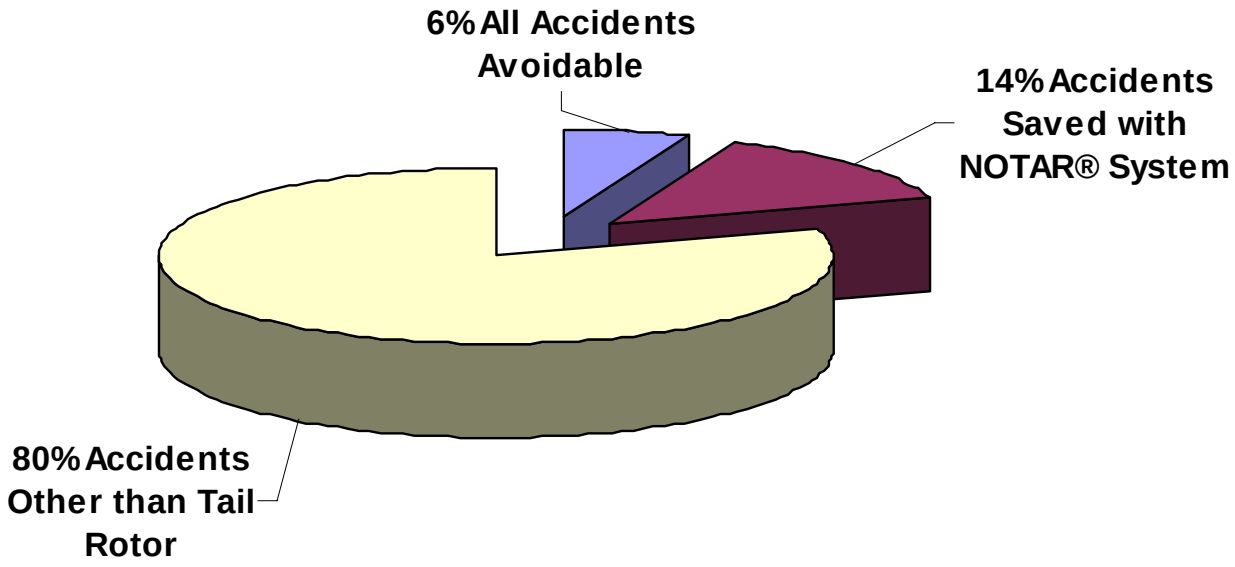
The elimination of the high-tip-speed tail rotor assembly makes the MD 520N® the quietest turbine helicopter in the world. Recent comparative FAA tests conducted by MDHI indicate the MD 520N® is a minimum of 50 percent quieter than comparable helicopters. This lower noise signature makes the MD 520N® a “good neighbor’ when used in areas where noise is objectionable. Lower noise levels also increase survivability in hostile operational roles.





11.3.5 INHERENT SAFETY

The NOTAR anti-torque system eliminates accidents and mishaps caused by the exposed tail rotor striking objects in flight, and significantly reduces ground incidents with people or equipment. Potential damage caused by foreign objects is also eliminated. Inherent design capabilities of the MD 520N® reduces the susceptibility to loss of tail rotor effectiveness and the problems associated with quartering tail winds. The power and stability of the MD 520N® in various wind conditions increase operational safety.



11.3.6 IMPROVED HANDLING

The excellent handling qualities of the MD 500 series have been further improved with the addition of the NOTAR® system. The MD 520N® has high control response provided by the fully articulated five-blade rotor system. Transient positive load factors of 2.8g's and negative load factors of 0.0g's are attainable with the MD 520N®. The NOTAR® system allows side and rearward flight speeds above 30 knots, low sensitivity to wind direction, 80 percent fewer pilot controls inputs and rapid turning rates.

12.0 MD 520N® Standard Equipment

*Required Options Included in Base Price as of 2008

Airframe

- Extended Landing Gear
- Rapid Door Removal Hinges (cockpit and cabin)
- Tinted Canopy Panels
- Tinted Door/window panel-left front
- Tinted Door/window panel-left rear
- Tinted Door/window panel-right front
- Tinted Door/window panel-right rear
- Rain Gutter Set
- Keyed Locks (4)
- Fuselage Hard Points
- Jacking Fittings
- Passenger Steps
- Anti-Collision Lights (3)
- Landing light, nose mounted
- Position lights

Interior

- LH Rotor Brake
- Heater Defogger System
- Crew Seats with 4-point Harness Restraint
- Passenger Seats with 3-point Harness Restraint
- Vinyl and Fabric Cushions
- Vinyl Interior Trim Panels
- Crew and Cabin Compartment Floor Carpet
- Map Case
- Fire Extinguisher
- First-Aid Kit
- Cabin 28-volt Utility Outlet
- Battery-Heavy Duty Marathon 17-amp hour
- Fresh Air Ventilation System
- Cockpit Utility Light
- Cabin Convenience Light
- Instrument Lighting
- Cabin Soundproofing
- Cargo Tie-Down Fittings

Rotor and Controls

- Dual LH Command Flight Controls

MD 520N
STANDARD EQUIPMENT

Engine and Electrical

- Rolls-Royce 250-C20R Engine, 450 shp (336 kw)
- Automatic engine reignition
- Engine wash kit, MD500 series
- 64 Gallon (242 L) Fuel System
- 85 amp Starter Generator
- External Power Receptacle
- Facet Oil Filter
- Engine anti-ice

Flight and Engine Instruments

- Engine Particle Separator Filter
- Dual tachometer, NR and N2
- Engine oil pressure indicator
- Engine torque meter
- N1 tachometer
- Fuel quantity indicator
- Digital chronometer
- Airspeed indicator
- Barometric altimeter
- DC ammeter
- Outside air temperature indicator
- Magnetic compass
- Digital/analog turbine outlet temp indicator
- Engine oil temp indicator

Annunciator Panel

- Battery Overtemp Warning Light
- Engine Chip Detector Warning Light
- Engine Out Warning Light
- Fan Transmission Chip Detector Warning Light
- Fuel Filter Obstruction Warning Light
- Fuel Low Warning Light
- Generator Out Warning Light
- Low Rotor rpm Warning Light
- Main Transmission Chip Detector Warning Light
- Main Transmission Oil Pressure Warning Light
- Main Transmission Oil Temp Warning Light

Miscellaneous

- Ground Handling Wheels
- Engine and Airframe Log Books
- Engine Maintenance Manual
- Battery Logbook
- Flight Manual
- Handbook of Maintenance Instructions
- Illustrated Parts Catalog
- Engine Exhaust Cover
- Engine Inlet Cover
- Pitot Tube Cover
- Main Rotor Blade Tie-Downs
- Tail Boom and Thruster Cover
- One color paint

13.0 MD 520N® Performance Specifications

Characteristics at Design Gross Weight		*Metric 1361 KG*	*Imperial 3000 lb.*	*Metric 1361 KG*	*Imperial 3350 lb*
Maximum Cruise Speed	Sea level 1524 m (5,000 ft)	237 km/hr 245 km/hr	128 kt (147 mph) 132 kt (152 mph)	229km/hr 230 km/hr	123 kt (142 mph) 133 kt (143 mph)
Maximum Permitted Speed	VNE at sea level	282 km/hr	152 kt (175 mph)	282 km/hr	152 kt (175 mph)
Maximum Range	Sea level 1524 m (5,000 ft)	378 km 412 km	204 nm (235 mi) 222 nm (256 mi)	365 km 389 km	197 nm (227 mi) 210 nm (242 mi)
Maximum Endurance	Sea level	2.4 hr	2.4 hr	2.2 hr	2.2 hr
Maximum Rate of Climb:(TOP)	Sea level, Standard day ISA +20° C day	9.7 m/sec 8.6 m/sec	1,913 fpm 1,687 fpm	7.9 m/sec 6.5 m/sec	1,546 fpm 1,280 fpm
Maximum Operating Altitude	Density Altitude	6097 m	20,000 ft	6097 m	20,000 ft
Service Ceiling	ISA	4970 m	16,300 ft	4024 m	13,200 ft
Maximum Hook Capacity		907 kg	2,000 lb	907 kg	2,000 lb
Hovering Performance In-ground effect Out-of-ground effect	Standard day ISA + 20° C day Standard day ISA + 20° C day	3901 m 2743 m 2865 m 1707 m	12,800 ft 9,000 ft 9,400 ft 5,600 ft	2835 m 1554 m 1707 m 427	9,300 ft 5,100 ft 5,600 ft 1,400 ft

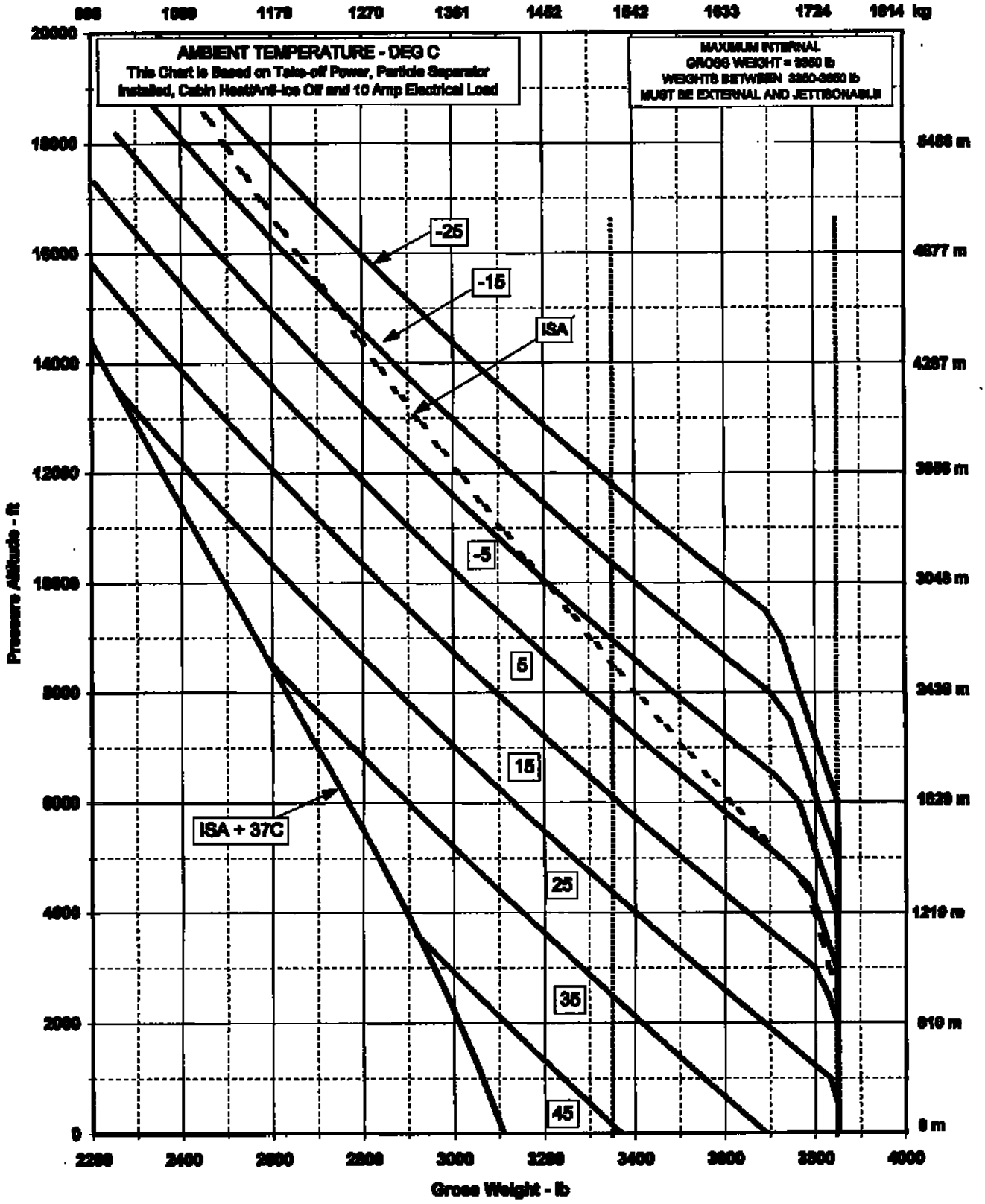
WEIGHTS

Characteristics			**Metric**	**Imperial**
Maximum Gross Weight		Normal Category External load operations	15191 kg 1746 kg	3,350 lb 3,850 lb
Empty Weight (configurations)	Standard Industrial		719 kg 674 kg	1,585 lb 1,486 lb
Useful Load	Standard configuration	Normal Category External load operations	800 kg 1027 kg	1,764 lb 2,264 lb lb
	Industrial configuration	Normal Category External load operations	845 kg 1072 kg	1,864 lb 2,364 lb lb
Usable Fuel Capacity	242 L (64 gal)		183 kg	403 lb

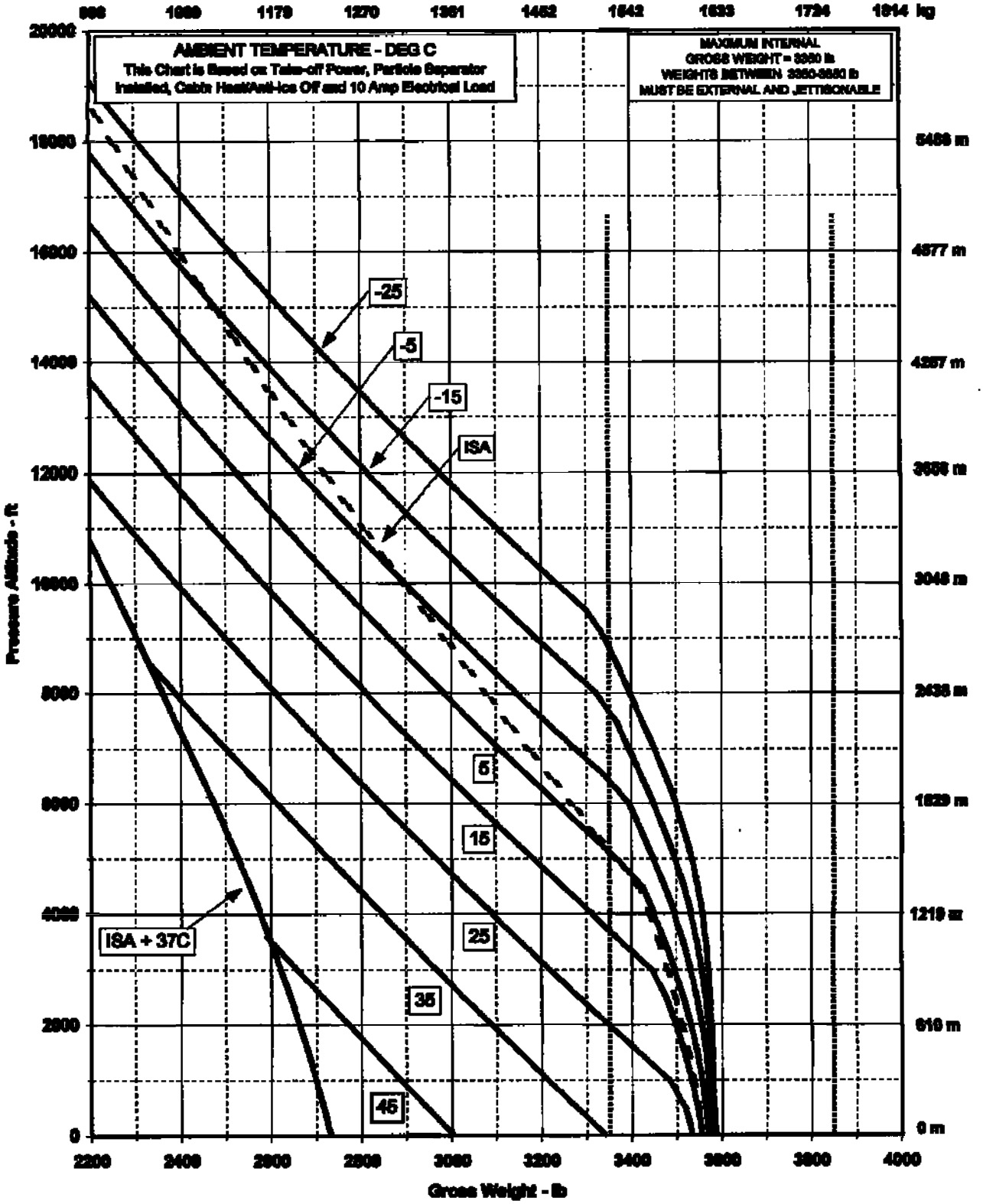
POWER PLANT

Characteristics			**Metric**	**Imperial**
Rolls-Royce Model 250-C20R gas turbine, Rated power:	Rated Power		336 kw	450 shp
Derated for reliability and safety to:	Takeoff Power Max. Cont. Power		317 kw 280 kw	425 shp 375 shp

13.1Hover-In-Ground-Effect.



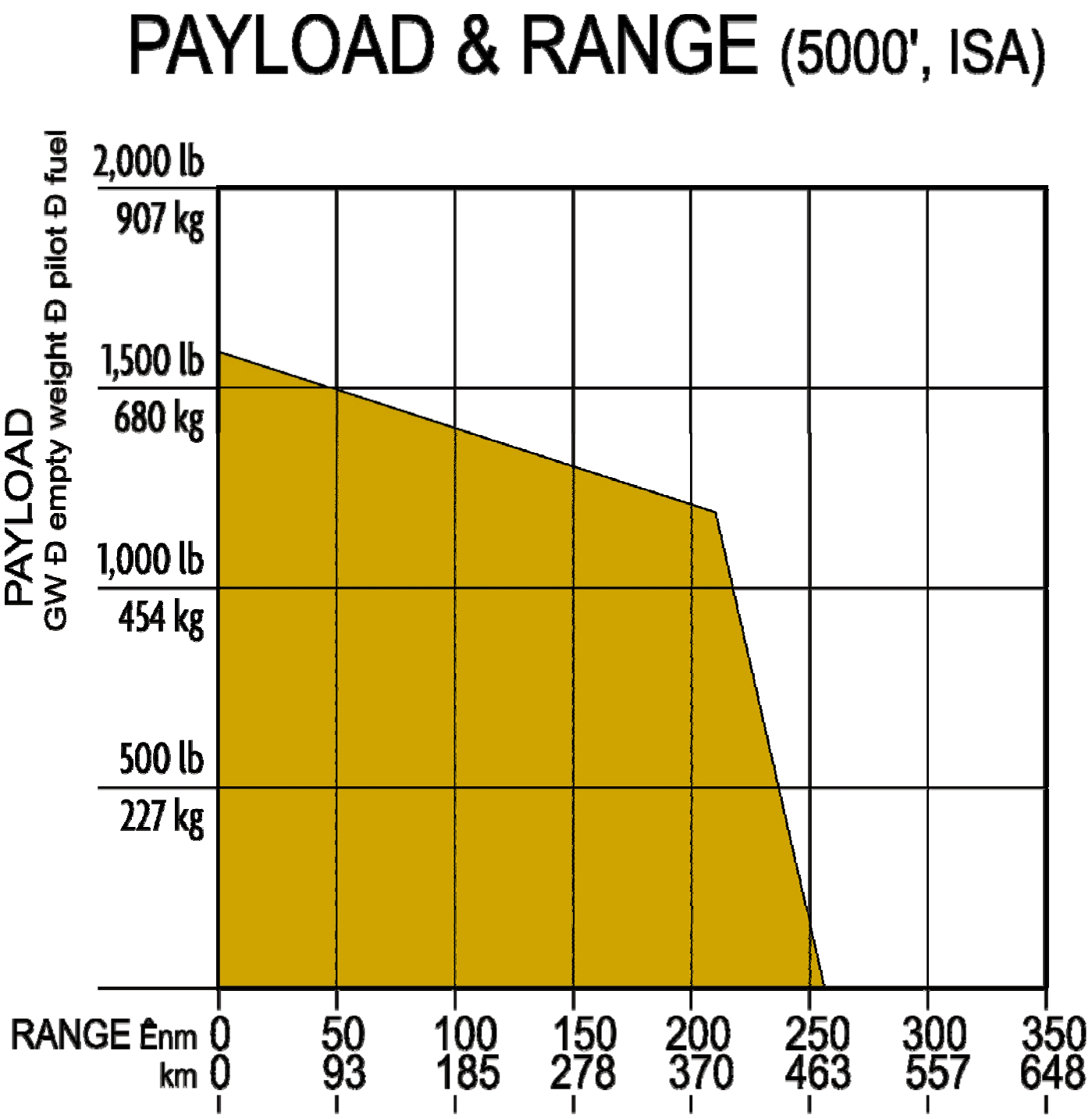
13.2 Hover-Out of-Ground-Effect.



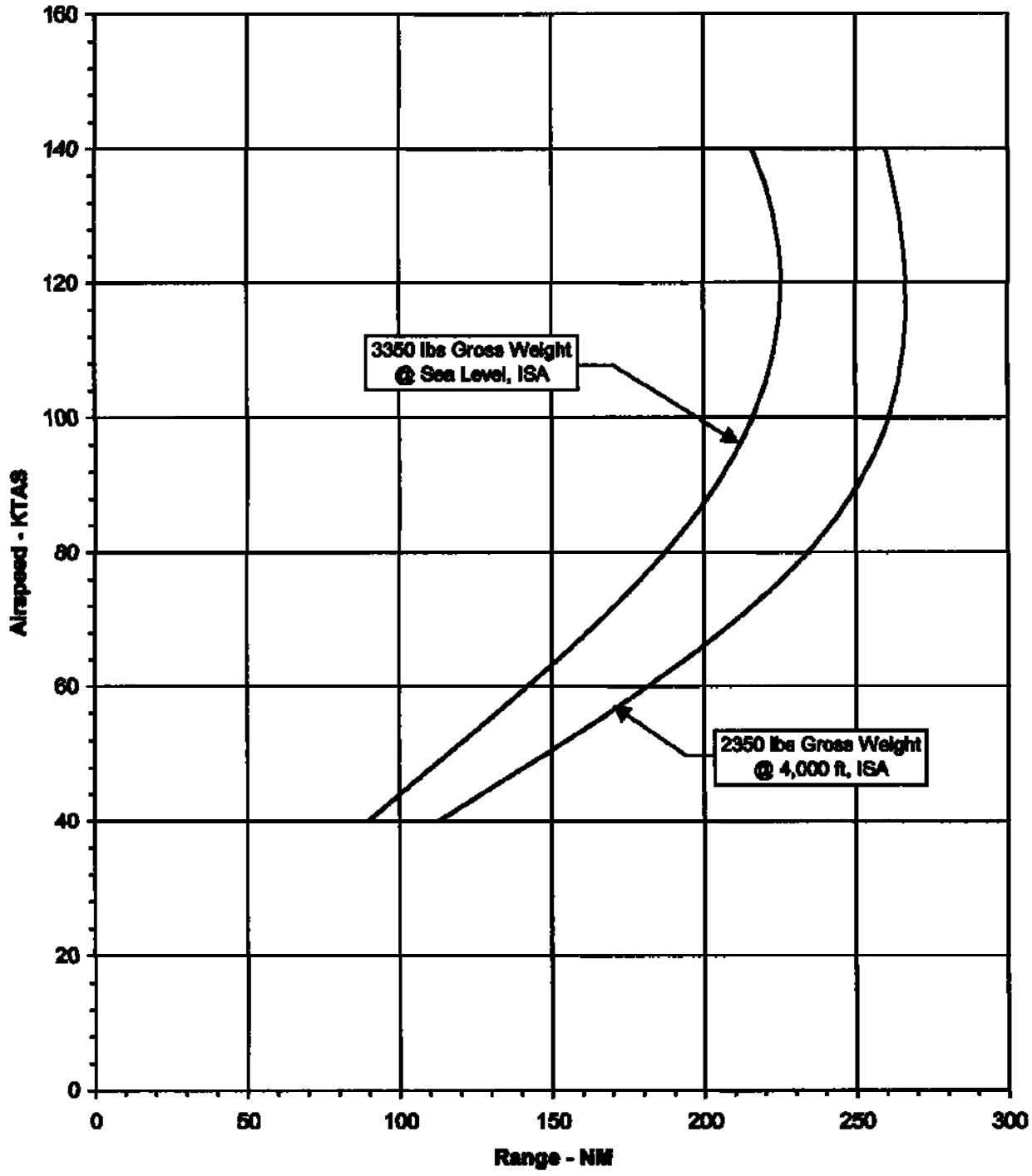
13.3 Takeoff Gross Weight Worksheet.

	C20B	Mission #1	Mission #2
Empty Weight	1,585 lb (719 kg)		
Pilot	170 lb (77 kg)		
Fuel	403 lb (183 kg)		
Payload	1192 lb (540 kg)		
Takeoff GW	3,350 lb (1519 kg)		

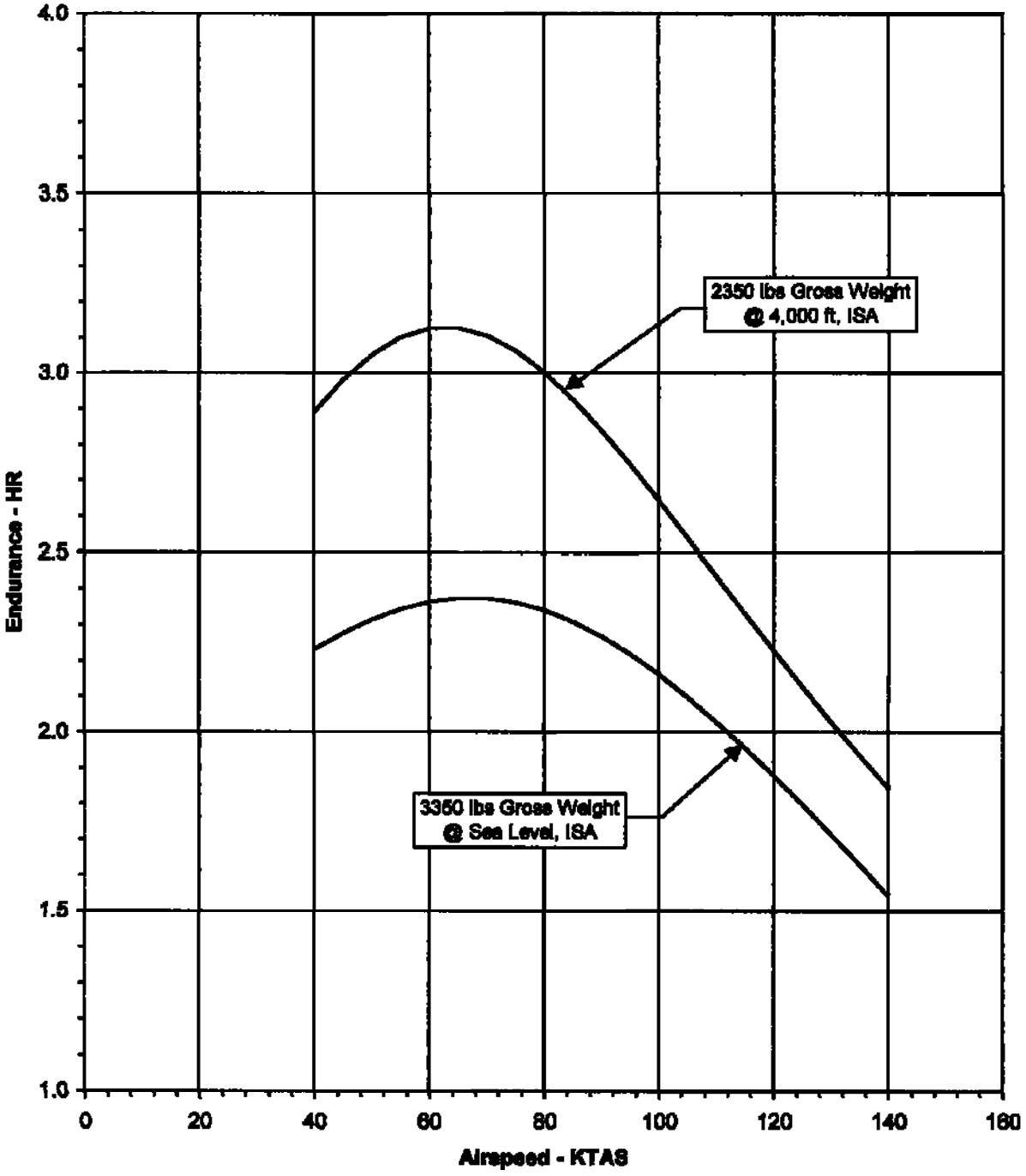
13.4 Payload vs Range (5,000', ISA)



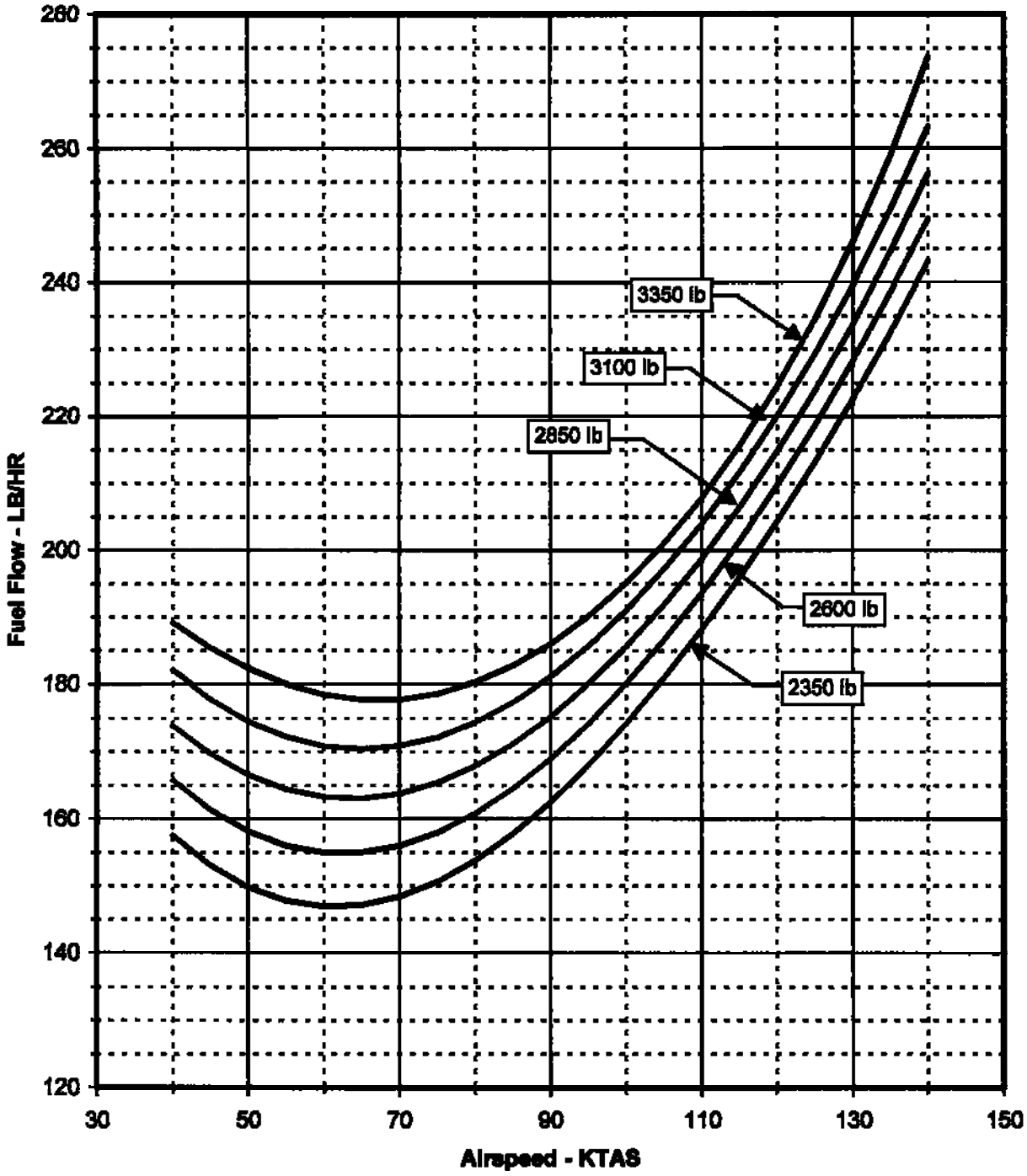
13.5 Speed for Best Range



13.6 Speed for Best Endurance

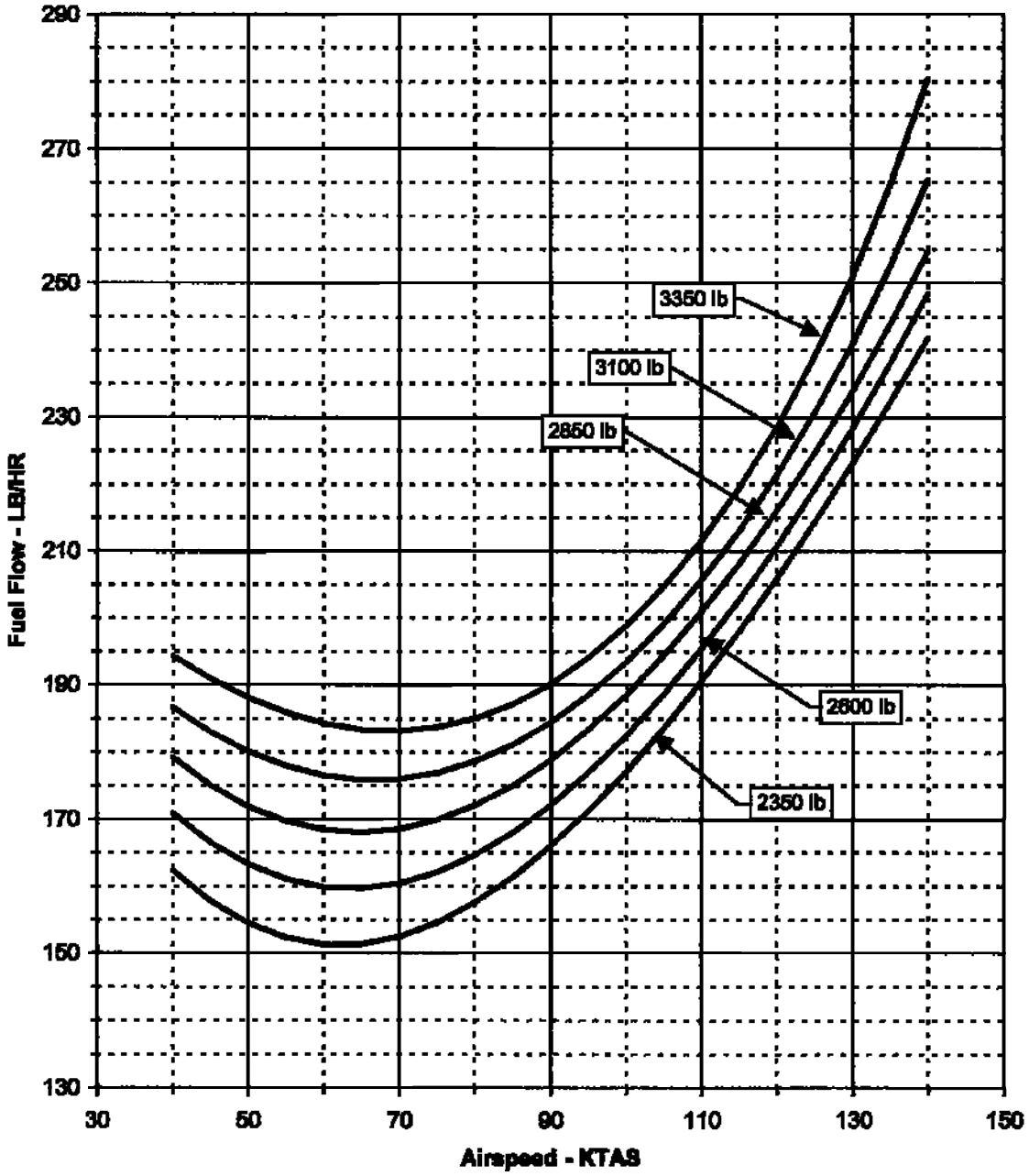


13.7 Fuel Flow, Sea Level, ISA (15°C)



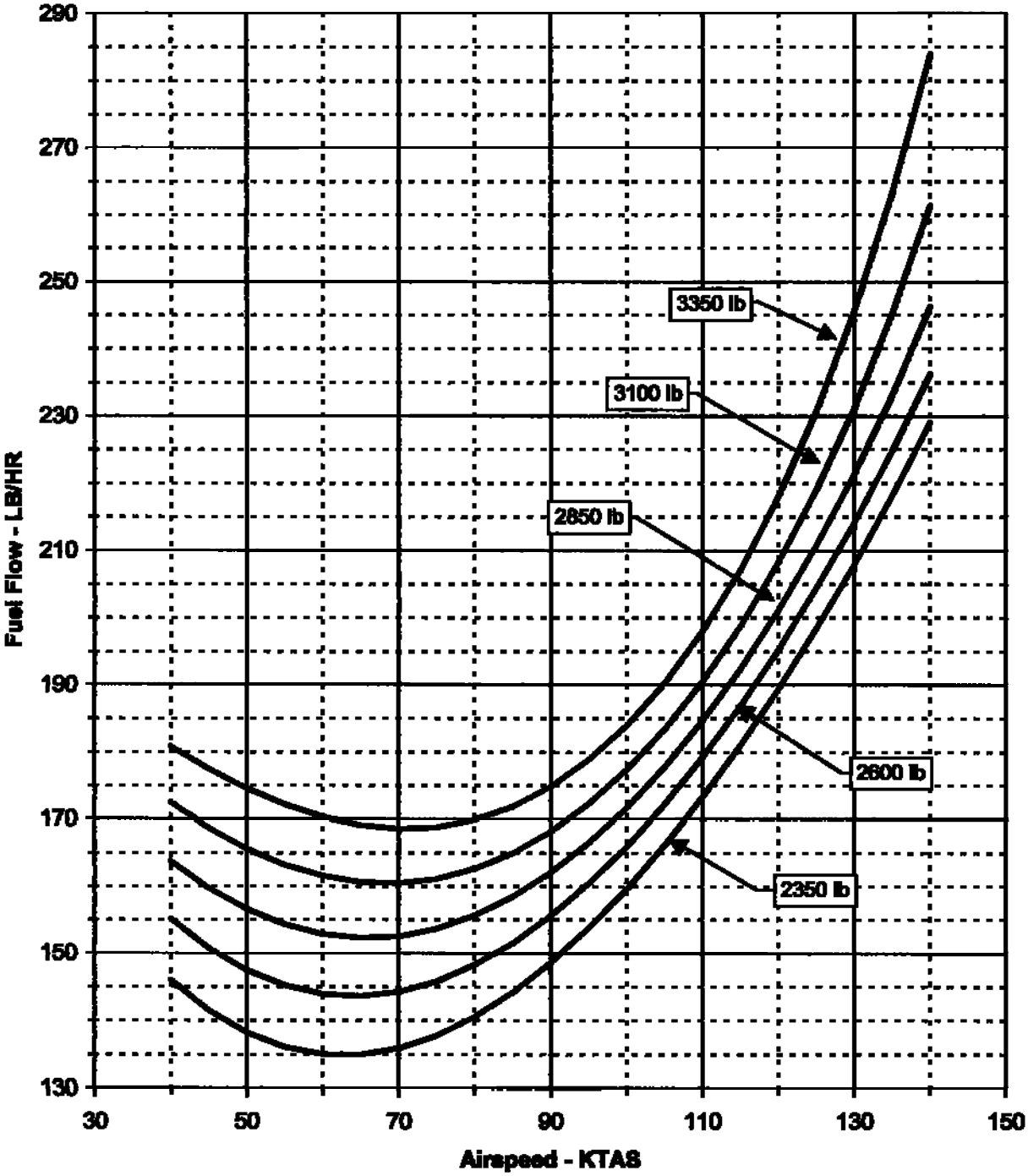
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load.

13.8 Fuel Flow, Sea Level, ISA +20°C (35°C)



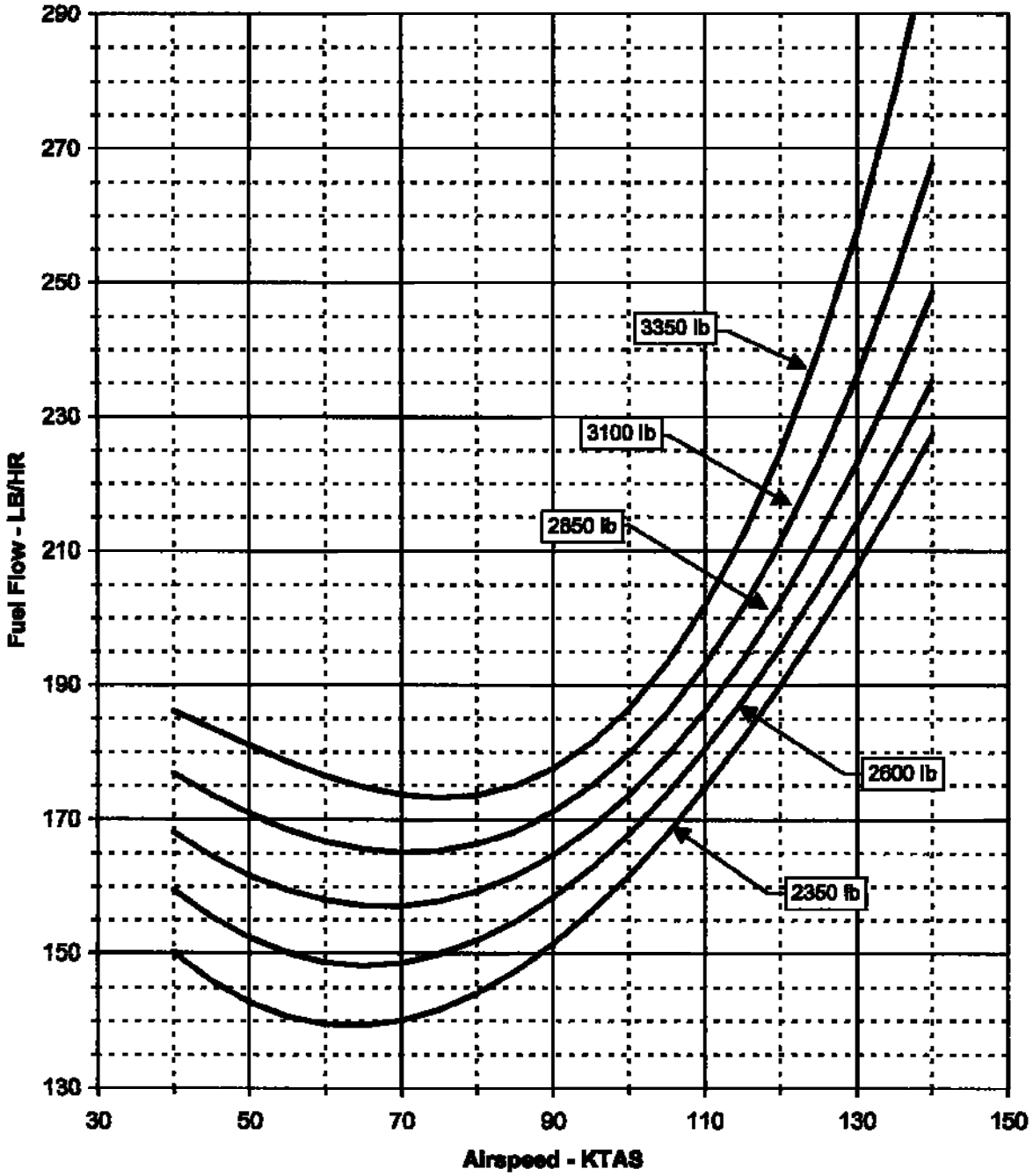
Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load

13.9 Fuel Flow, 4,000 feet, ISA (7°C)



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load

13.10 Fuel Flow, 4,000 feet, ISA +20°C (27°C).



Note: Use for Estimates Only. Not FAA Approved. Based on clean aircraft, level flight performance, minimum specification engine, particle separator and 10 ampere electrical load

14.0 MD 520N® Estimated Direct Operating Cost per Hour (Based upon year 2010US $)

	C20R+ Engine
Fuel and Lubricants [1]:	
Fuel @ $3.93* per gallon @ approx 32 gallons per hour.	$ 125.76
Lubricants @ 3% of fuel	$ 3.77
Total Fuel	**$ 129.53**
Airframe Maintenance and Spares[2]:	
Maintenance labor costs:	
Scheduled (.15 Manhours/Flight Hours) @ $75.00/Hour*	$ 11.25
Unscheduled (.26 Manhours/Flight Hours) @ $75.00/Hour*	$ 19.50
	$ 30.75
Spares Cost:	
Scheduled (Inspection) Parts: Used during periodic inspection i.e. filters, seals, o-rings, etc.....	$ 5.78
On-Condition/Unscheduled Part	$ 21.12
Reserves: Component Overhaul (TBO)	$ 45.83
Reserves: Limited-Life Parts	$ 40.99
Total Airframe Cost	**$ 113.72**
Engine[3]:	
Scheduled maintenance labor and parts.....	$ 3.00
Reserve for engine overhaul, spares and accessories	$ 73.20
Total Engine	**$ 76.20**
Total Direct Operating Cost[4]	**$350.20**

[1] Fuel cost and labor rate* is based on U.S. Average

Average cost while operating under the following conditions:
Gross Weight: 10% less than maximum certified
Speed: Maximum Range Speed, 117 KIAS306.14
Altitude: 1,000 feet on a standard day

[2] Overhaul costs are based on participation in factory exchange program

[3] Engine fleet maintenance costs provided by Rolls-Royce Engine Company

[4] Indirect costs such as insurance, hangar, salary, etc., are excluded

Cost figures shown are extrapolated from a broad database and are intended for example purposes only. Actual costs will vary, depending on local operating condition, pricing and supplier practices. We encourage you top compare these figures with other manufacturers, using the same unit costs for fuel, labor, etc.

14.1 MD 520N® Direct Operating Cost per Hour Worksheet

■ Fuel and Lubricants

Fuel @ $ per gallon @ approx. gallons per hour…….. $_____

Lubricants @ _____ % of fuel ……... $_____

Total Fuel and Lubricants Cost…… $_____(A)

■ Airframe Maintenance and Spares

Scheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____)……... $_____

Unscheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____) …… $_____

Scheduled (Inspection) Parts …… $_____

On-Condition/Unscheduled Part …… $_____

Reserves: Component Overhaul (TBO) …… $_____

Reserves: Limited-Life Parts …… $_____

Total Airframe Maintenance and Spares Cost…… $_____(B)

■ Engine

Scheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____) …….. $_____

Unscheduled maintenance labor rate @ $ _____ per hour

(Maintenance man-hour/flight hour=$ _____) __…… $_____

Reserves for engine overhaul and spares ……... $_____

Total Engine Cost …… $_____(C)

TOTAL DIRECT OPERATING COST (A+B+C) **……** $_____(D)

FIXED OPERATING COST

■ Depreciation

Hull insurance …… $_____

Liability insurance …… $_____

Pilot salary …… $_____

Hangar rental …… $_____

Total Annual Fixed Operating Cost …… $_____(E)

Total Hours (_____) flown annually (F) **……** $_____(F)

TOTAL FIXED OPERATING COST PER HOUR (E+F) **……** $_____(G)

Total Direct Operating Cost Per Hour (from above) **……** $_____(D)

TOTAL HOURLY FIXED OPERATING COST (D+G)**……** $_____

15.0 Component Maintenance Schedule

Limited Life Parts

Component	Finite Tiime (hr)
Main Rotor Blade	3,530
Blade Pin	7,600
Main Rotor Hub	8,900
Pitch Housing/MR	9,100
Retention Strap/MR	2.770
Bolt-Lead Lag/Mr	6,120
Lead Lag Link/MR	11,080
Drive Shaft	3,260
Mast	10,450
Transmission Coupling	3,200
Belllcrank	2,870
Control Rod	7,740
Fan Drive Shaft	2,620
Fan Blade Assembly	7,500
Fan Hub	7,500
Pitch Plate	7,500
Rotating Cone Assembly	10,000
Tailboom Assembly	10,000
Tube Torque	5,000

Overhaul Systems

Component	Finite Tiime (hr
Transmission/MR	5,000
M/R Swashplate	2,770
M/R Hub	2,770
Overrunning Clutch	1,800
Starter Generator	1,200
Blower Bearings	1,200
Fan Bearings	2,400
Fan Pitch Plate Bearings	2,400

16.0 MD500 SERIES OPTIONAL EQUIPMENT

Airspeed/Time	*lb*	*kg*
▪ Davtron 877 Digital Clock	0.2	0.1
▪ Heated Pitot Tube, MD 500E/530F	0.4	0.2
▪ Heated Pitot Tube, MD 520N	1.0	0.5

Altitude	*lb*	*kg*
▪ Blind Encoder Garmin GAE-43	2.0	0.9
▪ Encoding Altimeter 3-inch	3.7	1.7
▪ Instantaneous Vertical Speed Indicator	2.5	1.1
▪ KRA 10-00 Radar Alt W/KI250 Indicator	4.4	2.0
▪ KRA405B-15 Radar Alt W/KNI416 Indicator	10.5	4.8
▪ TRA 3000 Radar Alt with TRI 40 Indicator	2.6	1.2

Altitude/Heading	*lb*	*kg*
▪ Attitude Gyro Indicator 3-inch	3.1	1.4
▪ Directional Gyro-Panel Mounted	3.0	1.4
▪ KCS55A-01 Compass System	10.3	4.7
▪ KI229-00 Radio Magnetic Indicator	2.0	0.9
▪ Turn and Bank Indicator, 2-inch	1.4	0.6
▪ Turn and Bank Indicator, 3-inch (mid continent 1394T100-7Z)	1.6	0.7
▪ Turn and Bank Indicator, 3-inch United Instruments	1.6	0.7

Avionics	*lb*	*kg*
▪ GNS-430W NAV/COM/GPS	7.8	3.5
▪ GNS-430AW NAV/COM/GPS	7.8	3.5
▪ GNS-530W NAV/COM/GPS	9.8	4.4
▪ GNS-530AW NAV/COM/GPS	9.8	4.4
▪ GPS-400-GPS		
▪ GPS-500-GPS		
▪ GNC-420-COM/GPS		
▪ GMA-340 Audio Panel – Stereo		
▪ GMA-347 Audio Panel – Stereo, with Panel IPOD Unit		
▪ GTX-330D Transponder-Modes A,C,S with TIS Capability and Diversity Isolation (2 antenna)	4.3	2.0
▪ GTX-330 Transponder-Modes A,C,S w/o TIS Capability and Diversity	4.3	2.0
▪ GTX-327 Transponder-Modes A,C	4.3	2.0
▪ GMX-200 Multi Function Display Unit		
▪ GNC-250 XL – COMM/GPS		
▪ GDL-69 Satellite WX – w/o display		
▪ GDL-69A Satellite WX with XM radio – w/o display		
▪ KLN90B		
▪ KT76A Modes A,C Transponder	4.2	1.9
▪ KT76C Modes A,C Transponder	4.2	1.9
▪ KT-70 Modes A,C,S Transponder	5.2	2.4
▪ KDR510 Satellite Weather		
▪ Pointer 3000 ELT		

Comm/Intercom	lb	kg
▪ A711 Audio Panel	5.0	2.2
▪ AA97 Audio Panel System	2.8	1.3
▪ AMS-42F Dual Channel Audio Panel	2.8	1.3
▪ AMS-44 Dual Channel Audio Panel	5.7	2.6
▪ CD Player AM/FM Radio Stereo PS ENG PXE7300	4.7	2.1
▪ Cyclic Remote Frequency Switch	0.3	0.1
▪ Garmin GNA-340 Audio Panel	3.3	1.5
▪ Hand Held Comm Radio Provisions to include AA-34 Universal	1.1	0.5
▪ Headset Bose Series X Noise Canceling Stereo	1.1	0.5
▪ Headset David Clark H10-56	1.5	0.7
▪ Headset David Clark Noise Canceling H10-56HXP	2.3	1.0
▪ KMA24H-71 Audio Panel	6.2	2.8
▪ KMA24H-71 Dual Audio Control/Intercom		
▪ KTR908 COMM		
▪ KX165-25 10-watt COM/NAV Transceiver w/ KI-206 NAV Indicator	5.2 5.5	2.4 2.5
▪ KY196A-30 16-watt VHF COM Transceiver	3.1	1.4
▪ KY-96A-61 10-watt VHF COM Transceiver		
▪ NPX-138N – FM Transceiver 138-174 MHZ	21.4	9.7
▪ PA Siren System, External w/ AA-22 controller and TS-100WR speaker—with recessed mount	2.5	1.1
▪ Provisions Motorola Spectra 800 MHZ Radio		
▪ Rear Seat Transmit Capability, includes AA-12S rear seat audio panel and 2-each rear lapel cords. NOTE: Compatible with NAT audio panels	5.1	2.3
▪ SL-30 COM/NAV	5.1	2.3
▪ TDFM-6148 VHF HI/UHF LO/800 (136-174/403-512/800)	3.1	1.4
▪ TDFM-7000 Series 4 R/T System	27.2	12.3
▪ TFM-550 VHF Low/VHF/UHF High 30-50/138-174/403-512	4.2	1.9
▪ Wulfsberg RT5000 Transceiver		
▪ Wulfsberg C5000 Flex Comm Control Head		

Controls	lb	kg
▪ Mason Grip Installed – on pilot side only	1.0	0.5
▪ Right Side Pilot in Command		

Electrical System	lb	kg
▪ KA-22 Avionics Cooling Fan	2.2	1.0
▪ Lead Acid Battery G641S-17 amp hour	23.0	10.4
▪ 28-volt Cabin and Cockpit Receptacles	1.6	0.7

Engine	lb	kg
▪ Diamond J TOT Indicator 61000-34 (C20B Engine)		
▪ Diamond J TOT Indicator 61000-35 (C20R Engine)		
▪ Engine 250-C20R		
▪ Engine Exhaust Oil Breather HT-800		
▪ P/C Safety Valve Kit – for C20B Engine Only		

OPTIONAL EQUIPMENT

Environmental	*lb*	*kg*
▪ Air Conditioning R-134 with Forward Evaporator	88.8	40.3

Exterior Accessories	*lb*	*kg*
▪ Breeze Eastern Cargo Hook – require factory hard point	7.0	3.2
▪ Cargo Hook Load Weigh System – model E51		
▪ Cargo Hook with Hard Point		
▪ Dual Side Mount – FLR/NightSun – mount only	20.0	9.1
▪ Exterior Crew Handles (4 each)	5.0	2.3
▪ Four Bladed Tail Rotor	10.8	
▪ Meeker Engine Bay Quick Release Hinges	2.1	7.0
▪ Skid Mirror	2.0	0.9
▪ Tyler Special Operations Platform		
▪ Wire Strike Kit	15.4	7.0

Exterior Lights	*lb*	*kg*
▪ Provisions for Side Mounted SX-16 NightSun	19.5	8.8
▪ Pulse System for Existing Landing Light		
▪ Provisions for SX-16 NightSun and Thermal Imager Mounted on Meeker Dual Side Mount		
▪ SX-16 NightSun Side Mounted with Gold Reflector	65.0	29.5
▪ SX-16 Side Mounted w/o Gold Reflector	65.0	29.5
▪ SX-5 NightSun – Side Mounted		
▪ Night Scanner – 400 Candle Power – Belly Mounted	23.0	10.4
▪ Super Night Scanner – 800 Candle Power – Belly Mounted	23.0	10.4

Fuel System	*lb*	*kg*
▪ Airframe Fuel Filter Install – (500E/N – 503) (500F-505)	6.7	3.0
▪ Fargo 21 Gallon AUX Fuel Tank		

Gear/Handling	*lb*	*kg*
▪ Carbide Skid Shoes		

Infrared Cameras	*lb*	*kg*
▪ FLIR 8500 IR Camera System – Basic No Options – Side Mounted with Avalex 10-inch Monitor (For Domestic Use Only)		
▪ FLIR Equipment – 8500		
▪ Provisions for FLIR 7000/8000 Series Nose Mounted, includes turret mount and monitor; and all cables and wiring. NOTE: Does not include vibration isolation mount		
▪ Slass System for use with FLIR 7000/8000 Series and Wescam FLIR's Only		

OPTIONAL EQUIPMENT

Interior/Trim/Lights	*lb*	*kg*
▪ Instrument Panel Face Plate Modification	0	0
▪ Leather Covered Interior Panels		
▪ Leather Covered Seats		
▪ Mesh Seats		
▪ NVG Compatible Lighting External and Internal	6.0	
▪ Slant Panel Pedestal	3.0	

Mapping Systems	*lb*	*kg*
▪ Aero Computers LE-5000 Mapping Systems		
▪ Metamap Inc.		

Windows/Canopy	*lb*	*kg*
▪ Comfort Windows – 2 each Cabin, 2 each Cockpit; with slides		
▪ Comfort Windwos – 2 each Cabin, 2 each Cockpit; with pop out		
▪ Paravion Left Front Door Opener	1.5	0.7
▪ Paravion Right Front Door Opener	1.5	0.7
▪ 4 Place Door Opener Kit - Paravion	6.0	2.8

17.0 PRODUCT SUPPORT PLAN

MD Helicopters, Inc. is dedicated to a successful fielding of its new helicopters and to improve the support it currently offers operators of its commercial helicopters. In 2008, MD Helicopters, Inc. introduced the MD Power™ program. This comprehensive support plan provides customers the opportunity to level budget operating cost. An outline of the plan is presented below. Please contact a Region Sales Manager or MD Helicopters, Inc. Customer Support for additional details.

MD Power™:

- MD Power™ is designed to provide an owner / operator of a new or pre-owned MD Helicopter with the ability to budget the cost for airframe parts based upon usage, for the life of the contract.
- Under MD Power™ the hourly fixed rate covers all inclusive parts replacement at no additional charge.
- MD Power™ removes risk, and provides budget stability and predictability
- MD Power™ protects cash flow and profits from being affected by unexpected repair expenses

Added Value, ensuring peace of mind:

- MD provides single point of contact by coordinating
  - *Rolls Royce Engine Programs*
- Removes risk, and provides budget stability and predictability
- Smoothes maintenance costs by reducing the high risk / high cost unscheduled maintenance events
- Protects cash flow and profits from being affected by unexpected repair expenses

Other Benefits:

- Factory maintenance support through MD Authorized Service Center network
- Provides higher market value upon helicopter resale
- Transferable at time of sale to MDHI approved operator

MD Power™ Inclusions - Systems and Parts Covered:

The following airframe systems, subsystems, components and/or parts and other systems are included under MD Power™ unless otherwise excluded:

- MD Drive Train:
  - *Flight controls, Drive systems, Main rotors, NOTAR system, Hydraulics*
- Life-limited parts
- Repair and Overhaul Components
- Main and Tail Rotor Blades
- Airframe electrical systems
- Landing gear
- Mandatory MDHI Service Bulletins or FAA Airworthiness directives
- Rolls Royce 250 or C47 engines under the Rolls Royce Customer Care Elite Program

Operator Input:

Input from many of our existing fleet operators has been actively solicited by our support team. We have created Customer Satisfaction Advisory Teams, composed of operators from all over the world who are chartered to work together with MD Helicopters, Inc. technical representatives to lower operating costs, and to improve our products and the way we support them. As a result of this improved level of two-way communication, many improvements suggested by our customers are being included in our production, publications, and maintenance procedures.

Initial Fielding:

All new aircraft customers will be greeted at their facility by a Customer Support Technical Representative who is trained specifically on the operation and maintenance of MD Helicopters, Inc. These Technical Representatives are backed up by a factory team of MD Product Support Engineers who can be called upon at any time to support specific technical issues or questions that may arise.

Regular Maintenance:

Follow-up visits by MDHI Customer Support Technical Representatives will be performed as required at the regularly scheduled maintenance periods. This provides the customer with the latest maintenance information, and provides the factory with feedback on the operation, reliability and maintainability of their new aircraft. In addition, maintenance, rotorcraft flight and parts manuals are available on the MDHI website (www.mdhelicopters.com) free of charge.

Direct Operating Cost:

The operating cost of MD Helicopters, Inc. are planned to be the lowest in their classes. The plan is to keep the parts costs down, maximize the reliability of the helicopter systems, and minimize maintenance hours. This is accomplished by “benchmarking” all of these areas against the existing fleet of MD 500® helicopters, already one of the most reliable turbine helicopter lines in the world. Every part, system and maintenance procedure has undergone scrutiny before being incorporated on new production aircraft.

Spare Parts:

MD Helicopters, Inc. recognizes the importance of timely deliveries of spare parts to our customers. A thorough review of spare parts utilization has been conducted with the intent to significantly improve turnaround time of AOG spares. Additionally, MDHI will increase activities in using customer advanced spares requirement notification to eliminate known spare part requirements. MD Support Center has been established in Europe, where a significant inventory of spare parts, exchange components and tools are maintained.

18.0 TRAINING

The MD Helicopters, Inc. Commercial Training Center offers cost-effective factory designed training courses for MD 500 series pilots and maintenance crews. This training, given by senior instructors with extensive experience in our products, provides customers/students with the detailed knowledge of MDHI products that will increase safety, reduce insurance costs and result in more efficient operation of the aircraft. Training is customarily conducted at the MDHI facility in Mesa, but offsite training at the customer's facility can also be arranged. Training in customer aircraft can also be arranged.

Pilot Training:

The transition flight training course is designed to familiarize a rated helicopter pilot with the operation of the MD 500 series helicopter. This five-day course introduces the student to all the associated company publications as well as detailed explanations of all aircraft systems and daily/preflight inspection procedures. The ground school, including the exam and exam review, requires 16 to 20 hours to complete. The student will be expected to pass an exam demonstrating basic knowledge of the aircraft. The flight training syllabus includes five hours of instructor time and is broken down into four flight lessons:

- Normal Operations (pattern and hover work)
- Normal Operations and emergency procedures
- Heavy Weight Performance
- Emergency Procedures (auto rotations)

Recurrent pilot training consists of a two-day refresher course for any pilot who has previously attended the transition flight training course. Ground school includes a closed-book exam, review of AD's and notices, and a daily/preflight inspection review. A BFR (biennial flight review) can also be given in conjunction with this course and includes review of FAR Part 91 and an open book exam. Flight training consists of three hours of intensive emergency procedures review.

Maintenance Training:

The Airframe Maintenance Course is designed to familiarize a licensed A & P mechanic with the maintenance and inspection of all major systems on the aircraft. This 2-week course will require the student to learn and demonstrate the skill and knowledge required to safely perform selected maintenance tasks on the MD 500 series. The 1-week course is available to selected students with prior knowledge of MD products (the 500 series air- craft). The 80-hour syllabus is comprised of the following sections:

- Intro to helicopter design
- Landing gear
- Fan assembly
- Rotor assembly, controls and rigging
- Lubrication/fuel
- Engine controls
- Airframe
- Drive system
- Anti-torque
- Track and balance
- Powerplant
- Electrical systems